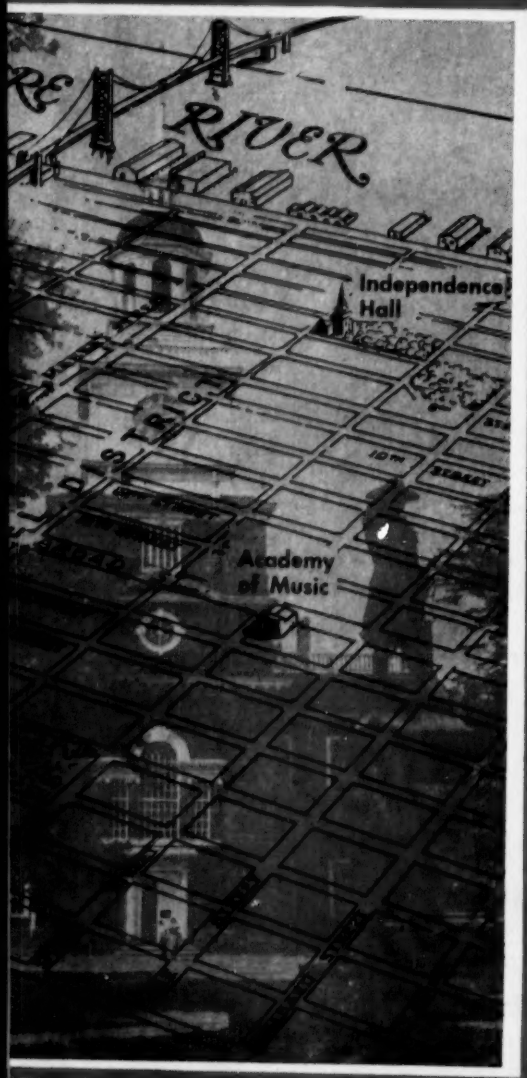
Chemical Week

November 26, 1955 Price 35 cents



- Philadelphia's tidewater shipping and populous market spur oil and chemical growth . . . . . p. 21
- . . . and Philadelphia's the site, too, of next month's 'Chem Show'; here's the data you need . . p. 65

Two trends in household glues: new synthetic formulations, easy-to-use packages . . . . . p. 98

Can a product's commercial development time be shortened? Industry experts think so . . p. 118

Top researchers are more than worth their higher salaries; here's why . . . . . p. 148

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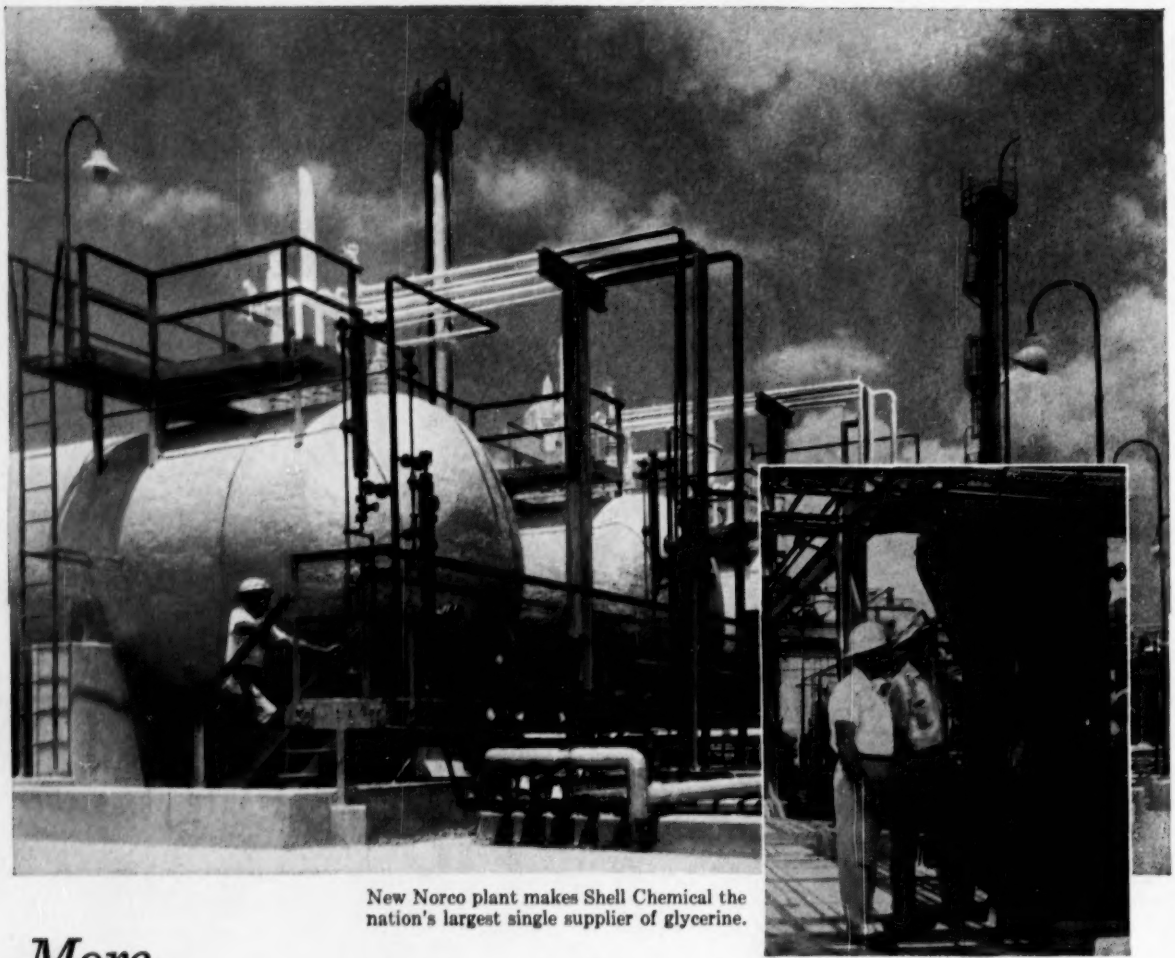

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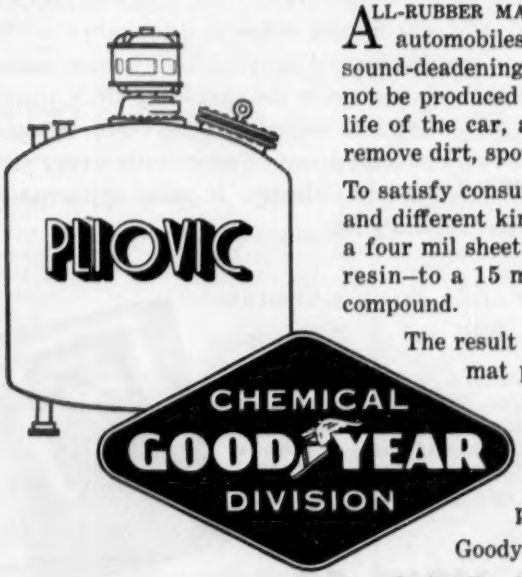

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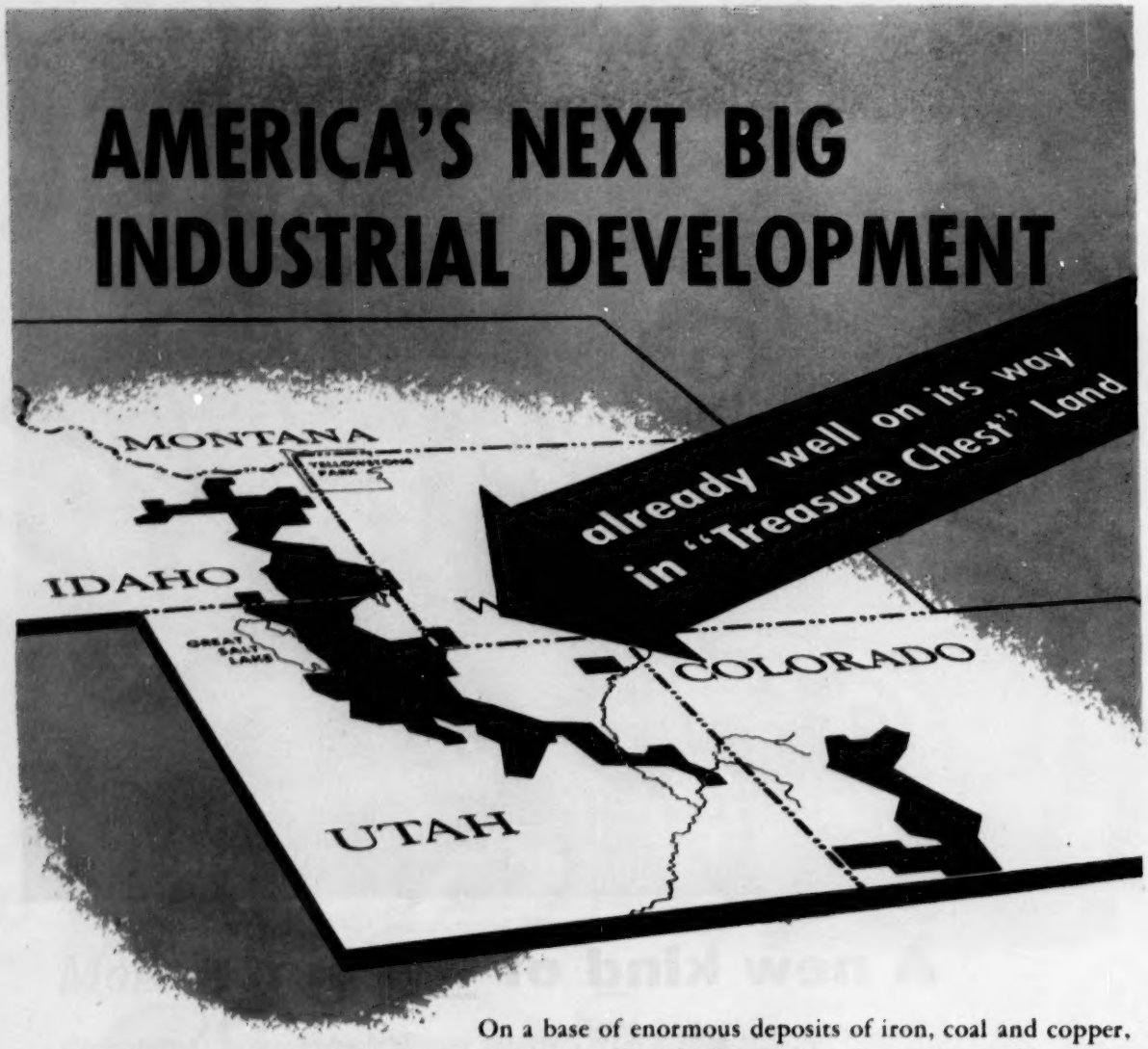

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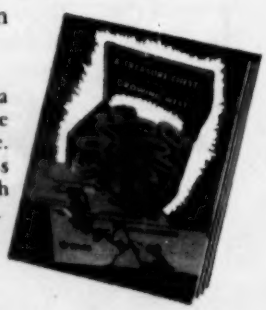

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A Growing Company in a Growing West

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OPINION . . . . . .

This Would Help . . .

TO THE EDITOR: I get a bit tired of hearing about the engineer shortage ("Gains Aren't Sufficient," *Nov. 5, p. 14*) . . . It is mighty wasteful to concentrate on training more technical men while we do little to make effective use of men now in the fields, and are not keeping a high percentage of those already trained.

How about more effort to make technical careers more attractive on a long-term basis? This would help:

- Give the individual technical man a broader view of the project he is working on, where it fits in the company, and a broader view of the company itself. And keep him informed of decisions dealing with his project and, where possible, the reasons for such decisions.
- Give him a wider variety of experience. Don't just stick him on the job nearest at hand.
- Let him see what happens to his project after it leaves his hands.
- Give him better, and more understanding, supervision. (It would help to pick supervisors for their managerial talent, rather than for demonstrated technical ability.)
- Relieve him of the time-consuming tasks a clerk, technician or errand boy could do.
- Last, but not least, pay experienced men enough to make it worthwhile for them to stay in the field. (The steps outlined above would help increase productivity enough so that industry could afford higher salaries.)

American industry has available a wealth of technical talent, which is just begging for better utilization. Any experienced man at the lower echelons knows this . . .

ARTHUR J. WEINBERGER
Bridegport, Conn.

. . . And This

TO THE EDITOR: A possible source of technical manpower to ease long-range shortages of chemists and chemical engineers (*Nov. 5, p. 14*) is within industry itself.

A vast number of potential technologists are already employed in industry but are stymied in their jobs because of financial inability to acquire the necessary formal education . . .

Individuals in this category do not feel industry is responsible for helping them. However, industry most certainly will help itself by aiding them. Financial assistance for their night-school education is suggested, but only as a "loan"—partial or entire, according to the individual circumstances.

The training initially acquired in their employment plus the education provided offer the employee opportunity for increased income, and at such subsequent date, by prearrangement, the sponsoring employer could be repaid in full, dollarwise; meanwhile he would reap the varied dividends of resultant loyalty and ultimately a well-rounded, well-adjusted, competent technologist.

PATRICIA LOWELL
Philadelphia

. . . And This, Too

TO THE EDITOR: I have read the moans and groans re the dearth of technical students . . . and how a sufficient number is not enrolled to meet industry's needs (*Nov. 5, p. 14*) . . . I'll agree that the problem can be alleviated somewhat by the establishment of scholarships and underwriting the education of worthy students . . . But I think there is one aspect of the situation that is seldom considered, and I think we should put the spotlight where it belongs: many Eastern schools are not short of students . . . they simply do not have the facilities to handle all the students they could enroll. (In the Midwest, the converse sometimes applies.)

Right now, for example, I have a specific problem . . . a need of $150,000 to acquire and move equipment into a perfectly satisfactory building that has previously been used as an industrial laboratory . . .

A great deal of attention has been paid to aiding students. Let's realize that most of those who want to go into chemical engineering find the means to do so; but in the Eastern schools,

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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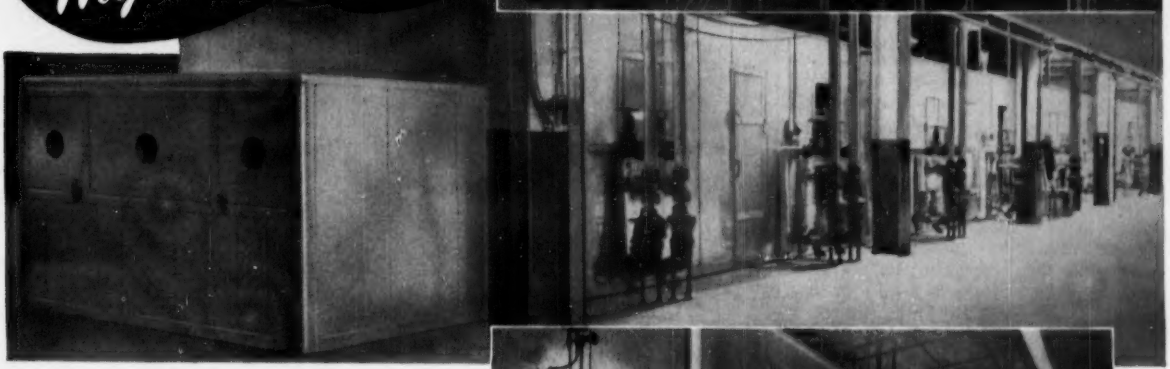

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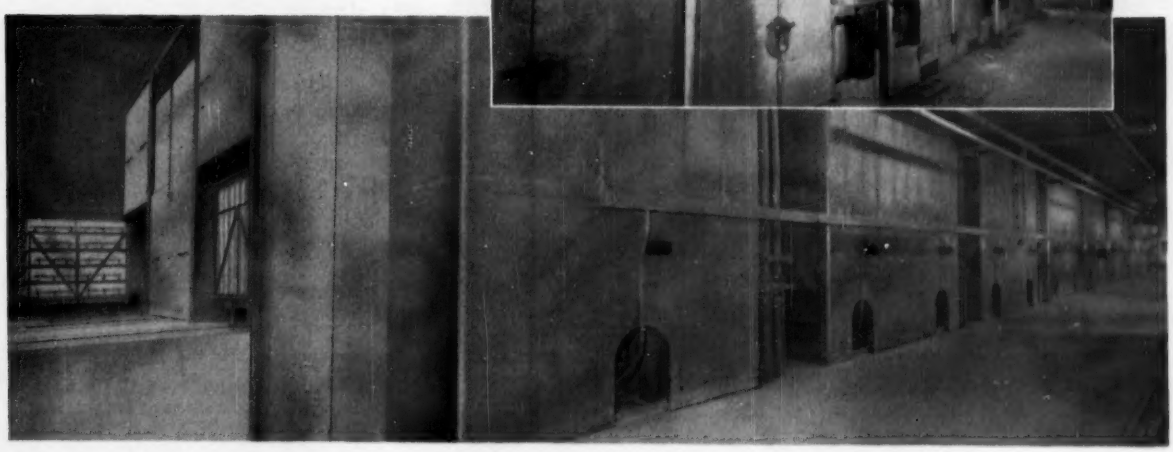

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OPINION . . . . . .

we do not have the facilities . . . laboratories, classrooms, chemical engineering units . . . We have the students; we can take care of more of them if we have more "production facilities". . . (I should like to emphasize that in the large Eastern metropolitan centers, student production is a function, not just of daytime schooling, but also of approved evening programs. This means, of course, "shift basis" use of facilities . . . effective production at relatively small investment . . .)

It is not too difficult a problem, either, to augment teaching and administrative staffs with high-caliber men. This is particularly true in chemical engineering.

What is needed is help in obtaining production floor space . . . an industry-supported program to do this will pay off in student dividends . . . fast . . .

C. L. MANTELL
Chairman
Chemical Engineering Dept.
Newark College of Engineering,
Newark, N. J.

Salesman's Lament

TO THE EDITOR: The time has come for a salesman to answer what you say about salesmen . . . For instance, the recent Distribution feature (*Oct. 29*) sure makes for an indictment of the field sales representative . . .

It points up some glaring faults which do not belong to the proper salesman with proper sales management. I think the long, accusative finger should be pointed at sales management when a condition like this is allowed to develop.

"Overspending salesmen" is something attributable to poor management at the district sales manager level. This can easily be brought into line on a month-to-month basis of control by working out sales versus travel and entertainment expenses. If a man is given free rein on expense and his salary is not too large, then what is to be expected? Every wide-awake sales manager can soon spot this type of sales waste.

But how about us poor devils who watch our sales budget, who struggle along and rely on our training, experience and technical know-how to push over a sale rather than try to buy the business? There are certainly more of us than there are of the free-wheelers. We try to get to know our customers and really help them; I feel that too many promises are made over the Martini glass which are rarely carried out when the fumes are dissipated. Most of us watch that buck for ourselves as well as for our company because we feel the idea is that if we cut costs we help ourselves to raises and promotions.

What I'm getting at is this: Salesmen travel excessively, call on marginal accounts, waste time when management gets lax. Too often it's Johnny Q. Peddler who gets it in the neck for things that are being done by the guys who could take him off the payroll.

Why don't you discuss some real hard-working chemical field representatives and show how they plan weeks ahead, how those plans are interrupted by customer SOS's, how they take it on the chin when production goes off, how they dig out competitive information and learn to combat it, how they fight for an order, plan for the real big orders and keep the regular customers happy?

Some of us study, too, when we get away from customer chasing, and we have reports to make out at night, and trade meetings to go to.

Remember too, we fight the elements, we fight car mechanical failures and highway maniacs who give us all grey hair. But most of us sales-go-getters still manage to come up smiling most of the time . . .

I do hope you will see fit to do something to put us poor hard-working fellows in a better light . . .

If this is published in any form please delete my name and address . . .

NAME WITHHELD

SEE YOU THERE

American Institute of Chemical Engineers, annual meeting, Statler Hotel, Detroit, Nov. 27-30.

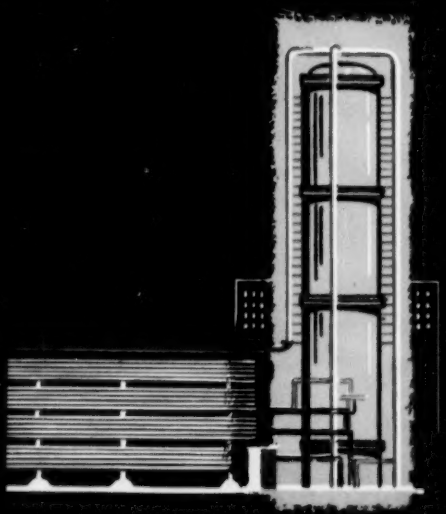
Synthetic Organic Chemical Manufacturers' Assn., annual dinner, Commodore Hotel, Dec. 1.

Chemical Specialties Manufacturers' Assn., annual meeting, Roosevelt Hotel, New York, Dec. 5-7.

American Mining Congress, annual membership meeting, New York, Dec. 6.

Chemical Industries Exposition, Commercial Museum and Convention Hall, Philadelphia, Dec. 5-9.

International Atomic Exposition, Cleveland Public Auditorium, Dec. 10-16.



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Facilities at Owens-Illinois are versatile. Talents are varied and many. So you can count on obtaining a container exactly suited to your needs—one that blends salesmaking beauty, product protection and utility in the proportions required to attract customers.

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Modern cartons are developed only through systematic consideration of their opportunity to serve you in the retail store and retail warehouse as well as on your own filling line and in transit. Owens-Illinois is pioneering such developments.

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Whatever product you produce, Owens-Illinois will help you plan your *salespackage*. This way you can have the services of a marketing-minded supplier with decades of experience in providing glass containers of all types, capacities and designs.

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In the midst of an abundance of available power, natural gas, water transportation and a host of related chemical products, Lummus is engineering and constructing an integrated 30,000,000 lb. per year vinyl acetate plant for Air Reduction Chemical Company, a division of Air Reduction Company, Inc. Adjacent to Air Reduction's National Carbide Division, it receives pipeline acetylene and converts it into vinyl acetate which goes principally into polyvinyl acetate emulsions, used in adhesives, latex paints and textile finishes — and polyvinyl alcohol, used for adhesives and textile finishes.

At Calvert City, in addition to this new Air Reduction plant, Lummus is also building a $6,000,000 high pressure acetylene derivatives plant for General Aniline & Film Corporation which is a "first" in its field. What better examples could be given to show that Lummus is ready, willing and able to design, engineer and construct your next chemical plant.

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Business

Newsletter

CHEMICAL WEEK
November 26, 1955

Proposed merger plans within the chemical industry were fizzling out last week—a sign, according to economic observers, that the trend toward diversification through amalgamation may be slowing down.

Biggest news of the week was word (confirmed by both companies) that the Catalin-Reichhold Chemical merger is off.

Insiders believe, however, that the end of negotiations is yet to be reached. Reason: for the first time in history, Reichhold has issued earnings figures ($40 million in sales for the first 9 months of 1955). This, they reason, could presage a public stock offering—probably within the next 12 months.

Also: Henry Reichhold holds what is believed to be the largest block of Catalin common stock—something less than 10% of all stock outstanding. Believing (as he does) that there is sound logic behind the merger of the two firms, Reichhold's next move could be a proxy fight.

On the ground that "it is not practicable at this time," the contemplated merger of American Viscose Corp. and Hercules Powder Co. has also been canceled. Amalgamation of the two companies (reported, but never officially affirmed) would have ranked as one of the largest in the chemical process industries—creating a company with assets of over $400 million.

Still unconfirmed, but reliably reported, is word that all is not harmonious in the proposed consolidation plans of Spencer Kellogg and Vick Chemical. Several other firms have been nibbling at the Spencer Kellogg bait; Vick, it's said, has lost much of its original enthusiasm for the deal.

•

Was there espionage and counterespionage snarled up in the tetracycline patent suit? That's a real question now—as a result of a wire-tapping case against lawyer and private detective John (Steve) Broady in New York City. Allegedly involved: Pfizer (which has been fighting to uphold the tetracycline patent it received earlier this year, *CW, Jan. 22, p. 15*); and E. R. Squibb (division of Olin Mathieson), and Bristol-Myers—two of Pfizer's opponents in the patent suit.

The cloak and dagger story spilled out into the open when Asst. District Attorney Aloysius Melia opened the state's case against Broady last week, and informed the jury that one of his witnesses would be Robert Porter, Pfizer's general counsel and secretary. Porter, claims Melia, will testify that he hired Broady to tap the wires of certain Pfizer officials to see if any confidential information was leaking out to competitors.

Added fuel to the fire: Carl Ruh—a former telephone company technician (awaiting sentence for illegal wire-tapping)—testified (under oath) that, acting under Broady's direction, he had tapped Bristol's long-distance lines as well as Squibb's local New York exchanges.

Broady's counsel, Sol Gelb, maintains that any wire-tapping done by Broady was legal—since it was done for a client who wanted its own phones "bugged" for business reasons.

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Causing almost as much excitement—though of a different kind— is the continuing mystery as to where Olin Mathieson will build its $80-million aluminum plant. Currently regarded as the favored spot: Cresap, W. Va.

If Cresap is chosen, the story goes, two other firms will join up in a three-way industrial development: American Gas and Electric Co., which would

construct a power plant, and the Hanna Coal Co. (a subsidiary of Pittsburgh Consolidation Coal Co.), which would open up a large coal mining operation to supply the necessary fuel.

•

Plans have been solidified concerning construction of Central Farmers Fertilizer Co.'s proposed fertilizer plant (*CW, Aug. 27, p. 60*). Work starts next spring on an 8-mile spur from the Union Pacific's main line to the cooperative's plant site—northeast of Georgetown, Idaho. That plus strip mining (giving Farmers Fertilizer a potential of 500,000 tons/year of rock) should be completed by mid-1956.

Next on tap: construction—at a cost of $7.5 million—of elemental phosphorus and calcium metaphosphate furnaces. Estimated date of completion of the entire expansion: late 1958.

•

Moving out into the aerosol propellent and refrigerant fields late next year will be the Pennsylvania Salt Manufacturing Co.

Initial products (to be produced at a multimillion-dollar plant already under construction at Calvert City, Ky.) include: trichloromonofluoromethane, dichlorodifluoromethane, and monochlorodifluoromethane. Early additions to the company's line: trichlorofluoroethane, and dichlorotetrafluoroethane. The series is tradenamed Isotron.

•

Phenolics line up as the fourth plastic to get a major trial as a material for aerosol containers. Working with phenolics for small units (but far from ready to launch commercial production) is Owens-Illinois Glass Co.

To date, there's only one plastic spray bottle on the U.S. market manufactured from melamine (made by Colt's Mfg. Co., Hartford, Conn.), although both nylon and polyethylene aerosols have been in use for some time.

•

The long-awaited launching in France of Procter & Gamble's Tide (*CW, March 26, p. 96*) materializes this week. First to sample it—in a merchandising push that P&G hopes will be a major challenge to Lever Bros.' detergents in France—will be the citizens of Rouen and Amiens.

Production of Tide in France has already started; the Cincinnati soaper admits to hoping to carve a sizable dent into France's yearly 700-million-lb. soap and syndet market.

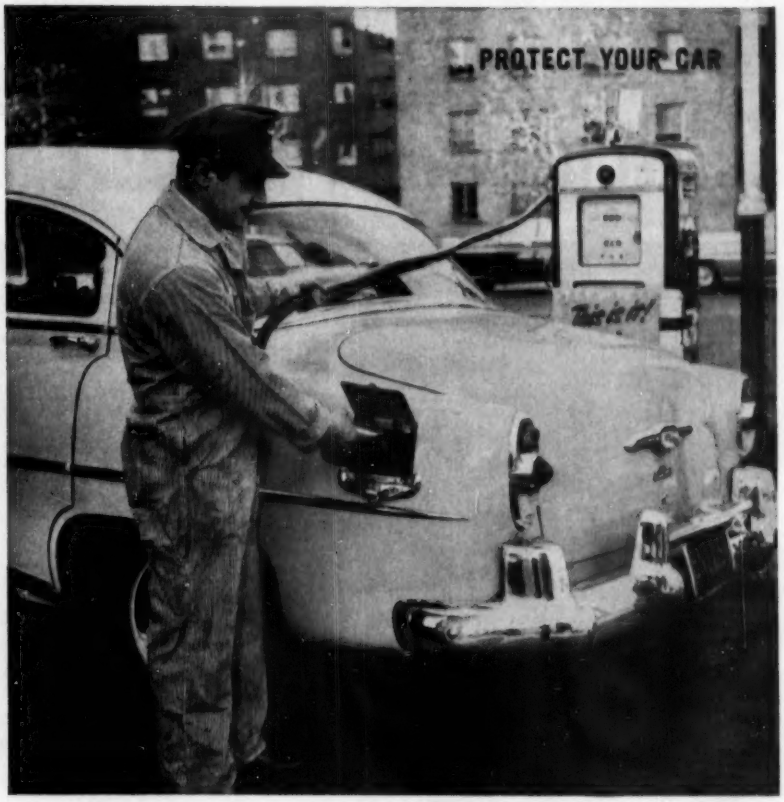
•

Almost, but not quite vindicated late last week was Jess Ritchie and his much-belabored battery additive, ADX-2.

A federal trade examiner, William L. Pack, has thrown out "for lack of evidence" the false-advertising charges against Ritchie's firm, Pioneers, Inc. (Oakland, Calif.). The commission, says the examiner, has failed to show that there was anything misleading in the claim that ADX-2 gives batteries longer life.

But Pack's action is not final, could be overturned by the full five-man commission, thereby reopening the case, which stirred public controversy for more than a year, and was reportedly the reason why the National Bureau of Standards' director, A. V. Astin, was temporarily fired.

HOW HERCULES HELPS...



AN INCREASED SUPPLY of para-cresol, raw material for antioxidants used in gasoline and rubber, will become available late in 1956 with the completion of the recently announced addition to Hercules' oxychemical plant in Gibbstown, N. J. This will more than double the amount now being produced by Hercules and is the sixth product to be made commercially by the Hercules' oxidation process. Para-cresol also plays an important part in the production of essential oils and in the manufacture of dyes.

FASTEST DRYING of all protective coatings, lacquer is ideally suited to keep pace with today's mass production methods. At the Standard Box Company in Pittsburgh, for example, a single-application hot-lacquer system protects beverage boxes with no delays for drying. Hercules works closely with the coatings industry in developing and perfecting new uses for lacquer-type coatings based on its nitrocellulose, ethyl cellulose, cellulose acetate, and Parlon® (chlorinated rubber).

ACID, ALKALI, AND WATER are all repelled when paper or paperboard are sized with Hercules Aquapel®. In corrugated cartons or spiral wound fiber drums where alkaline glues are used, Aquapel sizing effectively retards penetration of the glue. Neither a resin nor a wax, Aquapel is a chemical that reacts with the cellulose fiber to form a surface that is resistant to hot and cold water, acid or alkali. That's why so many paper mills are finding ever-increasing use for this new sizing agent.

HERCULES

CHEMICAL MATERIALS FOR INDUSTRY

HERCULES POWDER COMPANY
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SYNTHETIC RESINS, CELLULOSE PRODUCTS, CHEMICAL COTTON, TERPENE CHEMICALS, ROSIN AND ROSIN DERIVATIVES, CHLORINATED PRODUCTS, OXYCHEMICALS, EXPLOSIVES, AND OTHER CHEMICAL PROCESSING MATERIALS.

G55-11

FLAMMABLE CHEMICAL STORAGE SAFEGUARDED BY SPECIAL GRINNELL SYSTEM

At the Bridesburg plant of the Rohm & Haas Company, Philadelphia, Pa., protection of stored alcohol and monochlorobenzine is entrusted to a foam system installed by Grinnell. In the event of fire, flame-smothering foam covers the manhole, the most hazardous part of the tank; at the same time building up a foam blanket in the dyked area at base of tanks to kill fire there. (See test operation photos above.)

Mechanical foam, one of many special Grinnell fire protection systems, is used for fire hazards involving flammable liquids . . . such as in tank storage of chemicals; oil and paint rooms; loading racks; creosote tanks; pump houses; and processing rooms. Mechanical foam operates by shutting off the oxygen from the flammable vapors—and by insulating against the heat of the fire. It is flexible and adaptable; floats on liquids, flows over and around obstacles, clings to solids.

Call on Grinnell for help with your fire protection problems. Grinnell engineers are trained to evaluate your property and to advise on the proper system for your hazard. With a full range of equipment and more than 85 years experience in fire protection work, you are assured of unbiased recommendations which will be fitted to your exact needs. Grinnell Company, Inc., 288 West Exchange Street, Providence, R. I.

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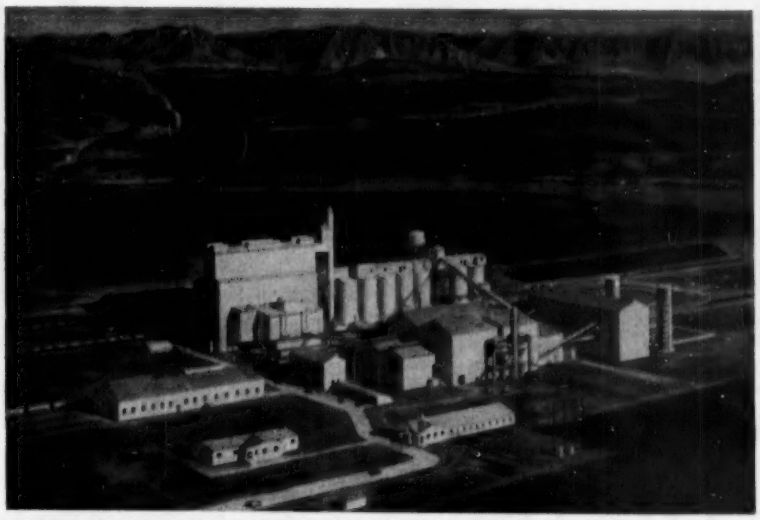
There's a GRINNELL Fire Protection System for every fire hazard

- **Automatic spray sprinklers** — wet pipe, dry pipe, and Simplex systems
- **Deluge spray sprinklers, rate-of-rise detection** — Multitrol wet or dry pipe systems
- **Emulsion and vapor dilution extinguishment** — Mulsifyre and ProtectoSpray systems
- **Water spray for cooling, insulation, and controlled burning** — ProtectoSpray systems
- **Mechanical foam blanket** — ProtectoFoam systems
- **Carbon dioxide blanket** — C-O-Two systems
- **Dry chemical systems**

BUSINESS & INDUSTRY . . .



MONTANA PHOSPHATE PLANT: As a newcomer, it's a pawn in . . .

Low-Rate Tax Tussles

In one or more of these three roles —manager, employer and employee— you're likely to have a stake in one or both of two tax suits that'll probably be decided on appeal this winter.

One suit—based on a stock option plan used by Michigan Chemical Co. —is expected to determine whether an employee participating in such a plan must pay federal income tax on the difference between the market value of the stock and the price he pays for it.

The other lawsuit — involving a phosphate plant built in southwestern Montana about five years ago by Victor Chemical Works—may set a precedent on the constitutionality of state laws that offer tax benefits to new industrial plants.

Salary or Ownership: In the first case, U.S. Internal Revenue Service is trying to collect straight income tax on about $9,000 of what it calls "additional compensation" that Philip Lobue received in 1946 and '47 while he was manager of Michigan Chemical's New York sales division.

The government says Lobue realized that amount above his regular salary in the form of company stock that he bought at $5/share during a period when the market value ranged from $8.69 to $19.25/share. U. S. attorneys say that a "favored corporation official" shouldn't be allowed to acquire those economic benefits without paying taxes under the same schedule that applies to employees who receive their compensation in other forms.

But the government's reasoning has been rejected, both in the U.S. Tax Court and in the Court of Appeals. Those judges ruled that the added value of the stocks was not taxable under U.S. revenue laws, because the purchase rights exercised by Lobue were given to him to provide a proprietary interest, and "not as compensation for services." The U.S. Supreme Court has agreed to hear arguments on this case, and its decision is likely to be handed down a few months from now.

Bid for New Plants: Back in 1951, Montana's legislators passed a law providing that industrial property— for the first three years that it's on the tax rolls—would be taxed on only 7% of assessed value, instead of the regular 30% basis. Similar measures designed to attract new industry have been enacted in other states.

Victor was permitted to pay on the cut-rate basis for 1951, but then the State Board of Equalization—relying on an opinion by Attorney General Arnold Olsen — denied Victor that privilege for 1952. Olsen's point of view was upheld in Silver Bow County district court, which found that the 1951 law was in conflict with the constitutional requirement that tax levies —within any category—must be uniform.

Now the case is being considered by the state supreme court, which heard arguments last week. The opposing view—favorable to Victor—is that the 1951 law merely gives a new concern an opportunity to become competitive with established rivals. Productivity, according to this school of thought, is a proper and legal standard for determining classification for tax purposes; and it might easily take three years for a new plant to attain peak productivity. The court's decision is expected by mid-January.

LOBUE: On profits from stock plan, must he pay straight income tax?

Mute Proof—That Korean-Set Chemical Expansion Goals Are No Longer Adequate

Commodity	Current Capacity Available* (in million lbs.)	Percent of Expansion Goal Gained	Commodity	Current Capacity Available* (in million lbs.)	Percent of Expansion Goal Gained
Phenol	622	100	Carbon black	2,294	99
Phthalic anhydride	382	104	Glycerine	255	78
Nitrogen	7,732	111	Sodium chlorate	110	76
Aniline	153	113	Ethanol†	480	117
Chlorine	7,382	107	Styrene, methylstyrene	1,124	93
Naphthalene	534	95	Soda ash	12,608	121
Oxygen**	34	97	Penicillin††	982	164
Phosphorous	552	100	Phosphate fertilizer (P_2O_5)	6,282	89
Anthraquinone vat dyes	47	98	Phosphate, feed grade (P_2O_5)	245	100
Carbon tetrachloride	324	98	Toluene†	284	154
Formaldehyde	1,671	100	Benzene†	429	114
DDT	146	94	Acetone	726	96
Iron oxide, yellow syn.	48	96	Sodium bichromate	274	91
Methanol†	211	93	Pentaerthritol	71	109
Calcium carbide	2,892	118	Acetic acid	784	106
Ethylene oxide	954	99	Sulfuric acid	38,000	106
Ethylene glycol	1,071	126	Argon**	467	121

* Plus capacity under construction as of June '55.
** In million cubic feet.
† In million (wine) gallons.
‡ In trillion units.

Needed: Relined Goal-lines

The ability of U.S. economy to use an increasing portion of the chemical capacity built since the start of the Korean War has, in general, made the chemical industry's mobilization base inadequate. That is now admitted by government planners.

But the government may be up against a serious dilemma—the problem of how to encourage a new round of expansion under current policy barring aid except to those companies making products "with specific defense uses."

First indication that official Washington realizes how close the industry is to its Korea-set expansion goals came this week when Theodore Hodgins (Reichhold Chemical executive on loan to head the BDSA Chemical & Rubber Division) released the first detailed rundown on current and abuilding capacity of 34 major chemical commodities.

On some commodities, the rundown (*see chart above*) shows that production has already come close to expansion targets; on others, only capacity has reached such a goal.

But, paradoxically, even this is a worry to some government men. As they reason it, whether or not a company has received tax benefits, if it has invested money in a plant, it would automatically keep part of the facility in stand-by for possible future government use. Thus, even while production (in some cases) is not yet approaching capacity, it's extremely likely that it could—particularly if over-all industrial production continues to climb during 1956.

Hence the worry about a chemical mobilization base, even under the "guns plus butter" concept on which all of the Korean goals were based.

Making a Start: In an attempt to better pinpoint the specific need for extending expansion goals, government chemical men have been reassessing the supply-demand relation of glycerine—as representative of those chemicals that appear to have at least a 20% deficiency.

Here, the previous goal had been 268 million lbs. of yearly capacity; 255 million lbs. were "in sight," and revised defense estimates brought total need up to 325 million lbs.

Moreover, mobilizers considered glycerine a particularly good test case, since besides demonstrating a sizable shortage, they could also point out the relation between glycerine and nitroglycerine to the nonchemically trained top-level mobilizers who go over each proposal to raise a goal. (And who, led by Secy. of the Treasury Humphrey, have been getting harder to convince on the validity of each succeeding request for tax aid.)

Rapid Response: In the case of glycerine, before reopening the goal, Defense Mobilizer Arthur Flemming gave companies through next June to file an interest in building new capacity. Almost immediate response showed that, though not as yet for-

HODGINS: Sees atomic energy as spur to broad new expansion.

mally covered by applications, commodity specialists are willing to oversubscribe the 325 million lbs.

Other chemicals on which similar fifth-or-more deficits below war needs exist include aniline, phosphorus, sodium chlorate and toluene.

These commodities are now being reviewed as was glycerine, and if specific figures can be obtained, there is a good chance that the goals will be reopened—despite broad-gauge opposition of Secy. of the Treasury Humphrey.

Humphrey's position is that the recent liberalization of the depreciation rules (which allows a company to write off two-thirds of its investment in the first half of a plant's life) is ample enough encouragement for expansion.

But, if a company getting a five-year write-off on part of an investment would be able to use the liberalized rules on the rest of it, write-offs provide a good incentive—at least for commodities on which civilian demands can be expected to increase.

"You're not going to get companies to put in plants with merely a write-off," says one commodity man, "if they don't see a market. Perhaps what you can do, though, is to get them to put in a plant now that they'd normally not start building before 1959." In view of the impracticalities of encouraging war-needed overcapacity by stockpiling, government plant-ownership and the like, this keeping-ahead philosophy is just about the only way —under current law—the government can maintain the mobilization base under current strategic concepts.

There should be another incentive to chemical industry expansion, suggests Director Hodgins this week. Says he:

"In about five years, the extent of atomic energy application to both products and processes in industry—especially in the chemical field—may become sufficiently rapid to institute the beginnings of a huge wave of capital equipment expenditures on new operational techniques . . .

"If we don't have a major recession or a depression in the next five years, it is very probable that we won't have one in the next 25 years. No economy of our type could become involved in a depression under conditions of really extensive capital outlays for new plant and equipment."

Says Beck: 'Too Fast' . . . McDonald: 'Too Slow'

WIDE WORLD WIDE WORLD

Labor Fusion at Last: What's in Store?

Early next month, in a hulking National Guard armory in Manhattan, the AFL and the CIO are scheduled to coalesce into a united federation of 16.1 million members. And the terms of this merger will help set the course of industrial relations at chemical plants for decades to come.

Among issues to be faced:

- Whether International Chemical Workers (AFL) and Oil, Chemical & Atomic Workers (CIO) are to be fused together, pasted together, or allowed to go their separate ways under a share-the-field pact.
- Whether the AFL-CIO chemical union or unions will be given tight control over the chemical jurisdiction, or whether other AFL-CIO unions—particularly the AFL's old-line craft unions—will be allowed to hang onto their present bargaining units in chemical plants and even try to increase such holdings.
- How fast a timetable will be adopted for organizing the approximately 250,000 unorganized chemical workers in the U.S. (especially those in the South); and how much money will be allocated for this drive.
- Whether there's to be any concerted attempt to put chemical labor bargaining on a company-wide or industry-wide basis; or to change chemical union policies on wages, fringe benefits, and strikes.

Steel or String: One thing management is wondering: just how much steel and how much string is going into the ties of unity that are to bind these many—and often times brawling—unions into one harmonious whole? The unity committee has drawn considerable criticism—some shouted, some whispered—from various powerful union chieftains. For example, David McDonald of the CIO Steelworkers was railing at the group for moving too slowly; and, more recently, Dave Beck of the AFL Teamsters has complained that merger is being consummated too fast.

Many unions are afraid that their interests will suffer in the merger, but the chemical unions of both AFL and CIO seem genuinely eager to come into closer relationship. These two unions are busily plugging teamwork to their members; for instance, recent joint bargaining on Monsanto pension problems is being hailed as the first of a series of joint efforts that'll be a boon to all members.

While these two unions are agreed that chemical plants should be organized on a plantwide basis, there are still many AFL leaders who refuse to concede this point. This was the issue that caused CIO unions to pull out of the AFL 20 years ago; and whether there can be organic unity while this principle is still in dispute is something about which chemical management will have to wait and see.

WIDE WORLD

FDA'S LARRICK: In ruling on food colors, he sets stage for . . .

Toxicity Showdown

Pale candy, wan oranges, and dark-hued anger are in prospect this week following Food & Drug Administration's notice that—effective next Feb. 14—it will bar the use of three coal-tar colors in foods.

But the agency's decision may be contested; and the political fuss that'll be raised may have a broader impact on chemical dye and color makers than can be gauged by the $800,000 annual sales of those three particular colors.

For it appears that Commissioner George Larrick's ruling against FD&C Red 32, Orange 1 and Orange 2 is likely to precipitate the long-awaited showdown on federal policy to prohibit use in foods of any color or additive that's found to be harmful when taken in large amounts—even if it's actually used only in very small amounts.

Citrus Men to Act: While this showdown could come in a move to have the U.S. Court of Appeals veto the FDA ruling, it seems more likely that the contest will come in Congressional hearing on a bill (H.R. 7732) that would specifically legalize the use of such colors in Florida oranges, some of which lack the lustrous orange color that occurs naturally in most California oranges.

While these dyes are used also in coloring butter, margarine, cheese, candy (especially Halloween bonbons), baked goods and hot dogs, it's the citrus usage that will be most vigorously debated. Dire forecasts are being made as to what'll happen to that industry if the ruling is not overturned. Said a spokesman for one growers' cooperative:

"Some long-time processors feel that this could put Florida out of the fresh citrus fruit business. It's really serious."

Lenience Hinted: On the other hand, it's possible that FDA may follow a path that would skirt a showdown for the time being. The agency is simply taking these three colors off a list of dyes that are considered safe in all proportions. The colors could still be used in foods, but at the risk of seizure or other federal action.

However, some people in industry see in a recent statement by Larrick a hint that FDA will not be very aggressive on this front. Larrick conceded publicly that these three colors are harmless in the amounts ordinarily used in foods.

EXPANSION

Bromine: Michigan Chemical Corp. (St. Louis, Mich.) will build a bromine plant near El Dorado, Ark., in collaboration with Murphy Corp. (of El Dorado).

Cost has not yet been revealed; completion of construction is scheduled for fall, 1956.

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Synthetic Rubber: The United Rubber and Chemical Co. is making plans to add to its synthetic rubber-making capacity at Baytown, Tex.

Details have not yet been completed, but United has already made arrangements for necessary additional land at its Baytown plant site, has purchased 88½ acres of adjacent property from Humble Oil & Refining Co.

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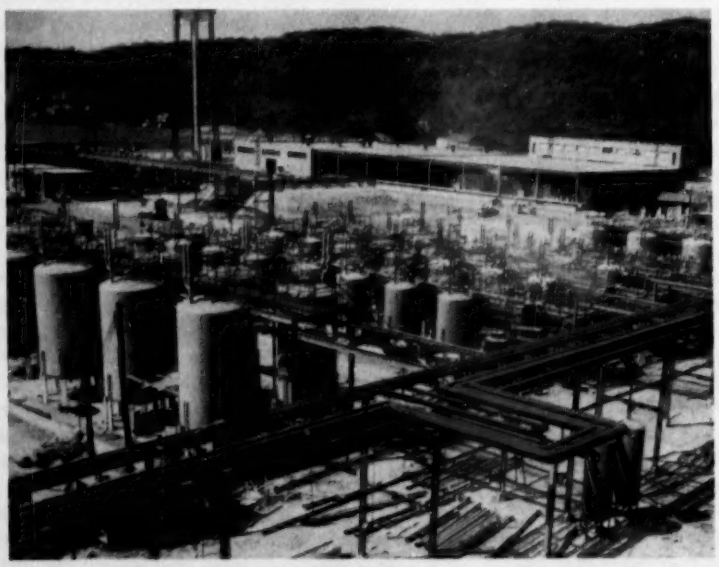
Paper: Hudson Pulp & Paper Corp. has agreed to build a $25-million newsprint mill adjoining its present kraft paper mill at Palatka, Fla., pro-



Close to Operating

RISING CLOSE TO completion this week is Linde Air Products' $14-million silicone plant (on the Ohio River) at Long Reach, W. Va. It's now estimated that close to 200 persons will be employed at the plant site by the end of 1955.

Output will be sold chiefly to aircraft, automotive and industrial manufacturers.

Washington Angles »

» **There's a chemical test of tariff laws** shaping up this week. Government mobilizers, using the oil-import provision of the Tariff Act, are checking to see whether they can limit imports of digitoxin. If lawyers can agree that the material is war-essential, look for action to keep the sole U.S. producer (I. P. Callison) in the business.

» **The new chemical patent searching code** (revealed by Patent Office officials to an advisory group studying office mechanization) may soon get a trial. It allows, Patent personnel say, a good deal more latitude in searching patents and technical literature than any current coding method.

« **Nonprofit research institutes** may be forced to open their financial records for public inspection, if a Treasury Dept. proposal is accepted by Congress. While the proposed legislation is aimed at politically controversial groups, it would also give private lab organizations a chance to be sure that tax-exempt institutes do not impinge on "commercial" business.

« **A federal court must study discrimination** charges brought against Gulf Oil by Negro workers —complaining that they couldn't get promotions— at its Port Arthur, Tex., refinery. Reason: the Supreme Court has reversed a ruling that the federal courts have no jurisdiction in the matter.

« **Du Pont-General Motors antitrust suit** details were being aired all over again in Washington last week. Government lawyers, who took part in the later-dismissed case, gave Senate antitrust probers a rundown on buyer-supplier relationships between the two firms as part of the committee's month-long study of General Motors—and how it does business.

The committee emphasizes it won't retry the suit; it's merely looking for a pattern to show the need—if any—for additional antitrust laws.

« **President Eisenhower is worried** about U.S. technical manpower shortages. Among the things he's studying at Gettysburg is a Cabinet committee report, which points out how supply of engineers and scientists can be boosted.

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vided it receives orders for its output from Florida newspaper publishers.

Estimated capacity of the newsprint mill: 100,000 tons/year.

•

Fertilizers: Pennsalt has started construction of a new fertilizer plant at Paulsboro, N. J. Completion is scheduled for June '56.

•

Bleached Pulp Board: Container Corp. of America (Chicago) will build a $30-million bleached sulfate pulp and board mill at Brewton, Ala.

Construction (on a 5,000-acre site) starts in January; completion is scheduled for the end of 1957.

•

Ethylene: Dow Chemical of Canada, Ltd., will start work early next year on a $4-million expansion involving construction of two new plants in Sarnia, Ont. Moreover, four existing plants (also at Sarnia) will be expanded early next year.

On tap for immediate construction: a $1-million pentachlorophenol plant, a $3-million ethylene plant.

•

Lithium: Lithium Corp. of America starts work immediately on expansion of its electrolytic plant at St. Louis Park, Minneapolis, Minn. No cost of the expansion has been revealed, but company officials say that capacity of both lithium and lithium hydride will be "substantially increased."

•

Paper: MacMillan & Bloedel, Ltd. (British Columbia) will build an $18-million expansion to its pulp and paper mill at Port Alberni.

Completion is scheduled for early 1958; when in operation, the plant will have a total capacity of 600 tons/day of newsprint.

COMPANIES. . . .

First public stock distribution of common stock of Revlon Products Corp. will be forthcoming shortly.

Due to be put on the market, for public sale: 373,900 shares—of which 272,067 shares will be issued to raise expansion funds, and 101,833 will be sold for the account of certain present stockholders.

•

American-Marietta Co. directors have approved acquisition of Southern Cement Corp.—a 74-year-old firm that operates two cement plants in the Birmingham, Ala., area. Stockholders will be asked to vote on the decision later this month.

•

Union Carbide and Carbon Corp.'s contract to operate four Atomic Energy Commission plants has been extended until June 30, 1960. (The present contract, under which it operates three Oak Ridge, Tenn., plants and one Paducah, Ky., plant, was due to expire June 30, 1957.)

•

Four more incorporations in Dover, Del., this week:

- Aries Chemicals, Inc., listing capital stock at 250 shares, no par value.
- Petrochemicals, Inc., also listing capital at 250 shares, no par value.
- State Pharmacal Co., listing authorized capital at $26,000.
- Drug Corp. of America, listing authorized capital stock at $250,000.

•

Vitro Corp. of America will process the uranium ore output of Hidden Splendor Mining Co., an Atlas Corp. subsidiary, at its Salt Lake City mill.

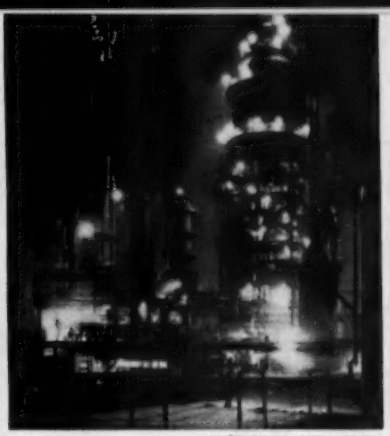
Hidden Splendor, whose holdings are located near Muddy River, in Emery County, Utah, will send to Salt Lake City a minimum of 5,000 tons of uranium ore monthly.

SODIUM BICHROMATE • POTASSIUM BICHROMATE • SODIUM CHROMATE • CHROMIC ACID • AMMONIUM BICHROMATE • KOREON (one-bath chrome tan)

MUTUAL CHEMICAL DIVISION

MUTUAL — ALLIED CHEMICAL & DYE CORPORATION

99 PARK AVENUE • NEW YORK 16, N. Y.



TYLER PHOTO, PHILADELPHIA

NAUTICAL NEIGHBORS: In Philadelphia and vicinity, river-side chemical plants* and oil refineries keep up . . .**

Titanic Boom on Tidewater Base

Philadelphia—long-ago supply point for 'vitriol' and whale oil—is more than holding its own as a major source of chemical and oil products.

In the heart of the eastern seaboard's greatest concentration of chemical industry, Philadelphia has two big assets making it worthwhile for these firms to keep expanding their operations here: mass market and seagoing shipping.

If great - great - grandfather were alive, alert, and still growing, he'd just about be on a par with the chemical process industries in Philadelphia and vicinity, which—after nearly 150 vigorous years—are expanding at the rate of about $50 million/year.

Since the end of World War II, those industries have bolstered their holdings in this area by some $550 million worth of construction and equipment; and their present plans call for additional plant expenditures of $180 million or more between now and 1960. And these figures don't include growth projects on the part of the region's numerous smaller chemical concerns.

Oil and chemicals have grown up together in Philadelphia and other seaports along the Delaware River, with oil in the dominant role ever since Edwin Drake drilled, at Titusville, Pa., the first oil well in the U.S. From then on, the oil companies have been big consumers of chemicals and —in recent years—producers of various petrochemicals.

Chemicals Came First: One of Philadelphia's pioneers in chemical production was John Harrison. As a bewhiskered young chemist back in 1806, he persuaded a suspicious landlord to rent him a cellar on Green St. near Third, and there he began turning out "oil of vitriol," as sulfuric acid was known then. He never had a losing year, so far as is known; in one year, his annual output went up 1,100%—from 300 to 3,500 carboys.

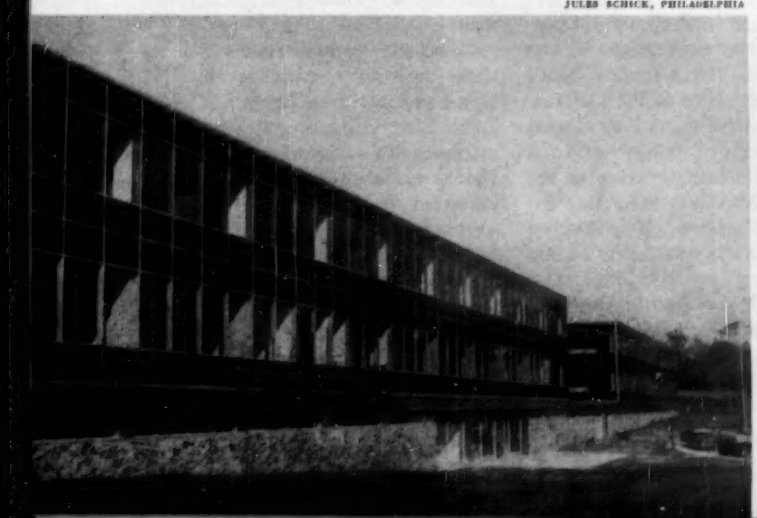
Not long after Harrison launched his chemical business, another infant industry was getting started along the Delaware. Whaling men — seeking markets for their catches—were attracted to this easily navigable tidewater stream that allowed them to bring their blubbery cargoes right up into populous city areas. Enterprising business men set up refining plants near the wharves to process the whale oil; and this trade was the forerunner of the petroleum refining industry that is now such a colossus in Greater Philadelphia.

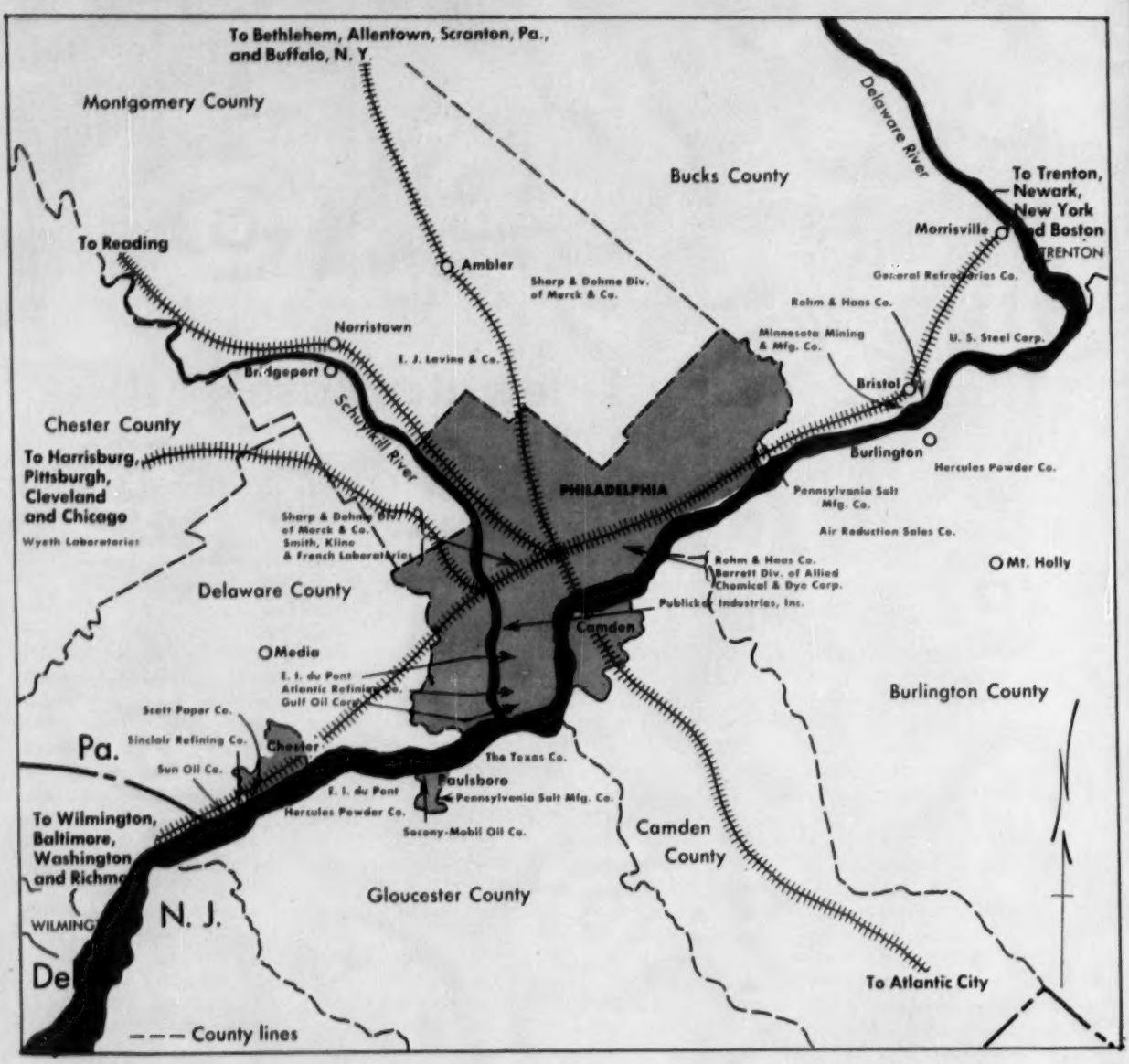
In each case, the economics reasoning was the same: the location is close to the country's mass markets and can be reached by ocean and coastal shipping. Some 40 million people now live within 250 miles of Philadelphia, and within 500 miles is nearly 70% of the nation's manufacturing employment.

* Such as Rohm & Haas at Bristol.
** Like Atlantic Refining in Philadelphia.

PHARMACEUTICALS, OXYCHEMICALS: Wyeth near West Chester, Pa.; Hercules at Gibbstown, N. J.

JULES SCHICK, PHILADELPHIA





World Status Foreseen: This area is the second largest refining center in the U. S., surpassed only by the Texas Gulf Coast; and, at its present rate of expansion, it may become the petroleum processing capital of the entire world. No other refining area is believed to have so fast a growth schedule.

Build-up of Greater Philadelphia refineries between 1945 and 1960 is expected to come to a total of approximately $600 million; and still more construction is anticipated after that.

Oil, it is said, loves tidewater. So do chemicals.

In Philadelphia, those industries find a great tidewater port, 90 miles up the deep-channeled Delaware River from Delaware Breakwater. Deep-draught tankers and freighters can steam upriver as far as Trenton, N. J., nearly 40 miles north of Philadelphia. There are dockside operations at hundreds of millions of dollars' worth of modern piers along the river in the Greater Philadelphia area, making unnecessary the expensive ship-to-shore lighterage that's needed at some big ports.

Supporting Roles: But the river and the people still aren't enough to account for the area's industrial boom. Such a success story requires many supporting roles and a lot of "props"; and Greater Philadelphia has supplied them.

Overland transportation includes three major railroads, modernized highways, and five petroleum pipelines. Electric power production has increased by more than 60% since 1945; and there's been room for more industrial plant sites all along the river—e.g., U. S. Steel was able to find a 3,900-acre site for its mammoth Fairless Works that opened several years ago near Morrisville, Pa.

The area isn't particularly noted for its own raw materials, but for

FLOURISHING AT 'PHILLY'

(Major chemical process companies' current expansion programs—Philadelphia and vicinity)

In Philadelphia

Atlantic Refining Co.	$172,000,000
Barrett Division, Allied Chemical & Dye Corp.	14,000,000
E. I. du Pont de Nemours & Co.	5,000,000
Gulf Oil Corp.	100,000,000
Publicker Industries, Inc.	44,000,000
Rohm & Haas Co.	25,000,000
Sharp & Dohme Division, Merck & Co.	1,000,000
Smith, Kline & French Laboratories	17,000,000

In Bucks County

General Refractories Co.	5,000,000
Minnesota Mining & Mfg. Co.	6,000,000
Rohm & Haas Co.	35,000,000
U. S. Steel Corp.	400,000,000

In Montgomery County

E. J. Lavino & Co	6,400,000
Sharp & Dohme Division, Merck & Co.	20,000,000

In Chester County

Wyeth Laboratories	9,000,000

In Delaware County

Scott Paper Co.	25,000,000
Sinclair Refining Co.	26,000,000
Sun Oil Co.	88,000,000

In Gloucester County, N.J.

E. I. du Pont de Nemours & Co.	5,000,000
Hercules Powder Co.	10,000,000
Pennsylvania Salt Mfg. Co.	2,600,000
Socony Mobil Oil Co.	45,000,000
The Texas Co.	60,000,000

In Burlington County, N.J.

Air Reduction Sales Co.	10,000,000
Hercules Powder Co.	5,000,000

some resources you don't have far to go. Pennsylvania ranks first among the 48 states in production of coal, coke, cement, stone, slate and cobalt; second in clays and lime. New Jersey's more modest mining operations produce zinc ore, limestone, magnesium compounds and manganiferous residuum.

Industrial Neighbors: The Delaware River and the Greater Philadelphia area are at the intersection of New Jersey and Pennsylvania, which together contain 20% of the nation's industrial chemical plants. Outside of this area—but still so close as to be neighbors—are such other great industrial complexes as those at New York City, Newark, Jersey City and Wilmington, Del.

A Philadelphia bank noted last week that "chemicals play a billion-dollar role in the Philadelphia area," and the Federal Reserve Bank of Philadelphia last spring compiled figures showing that capital expenditures by chemical and petroleum companies in the area far surpass those of all other industries. And this is confirmed by the expansion survey recently completed by the Chamber of Commerce of Greater Philadelphia.

That survey shows that during the 15-year period ending in 1960, 85 industrial and utility concerns in a 3-state, 11-county area will have added nearly $4 billion to their plant investments. Approximately 75% of that work has been completed up to this month. The roster includes 15 chemical and pharmaceutical manufacturers and 7 petroleum refiners, some of which are in Delaware and are not shown on the map (*p. 22*) or the table (*left*).

Still Coming: Only last week, one of Philadelphia's major chemical concerns announced still another expansion project for this list. Pennsylvania Salt has started building—on a site adjoining its Mantua Point plant at Paulsboro—a unit for production of commercial fertilizers in granular form. This facility will be operated by Pennsalt's I. P. Thomas Co. division, an 83-year-old establishment acquired by Pennsalt in 1954, and is to go on-stream early next year.

Largest all-chemical expansion program in the area is that of Rohm & Haas, which has put about $55 million into its Bristol and Philadelphia plants over the past 10 years and has plans for at least $5 million more in new construction and equipment. Hercules Powder Co. put its Gibbstown plant into operation last February and its Burlington works came onstream in September. Du Pont and Sharp & Dohme also have been expanding at two locations each within the area.

The Chamber of Commerce survey—limited to those companies whose 15-year expansion programs totaled $5 million or more—touched only a few of the area's more than 200 chemical process companies. There's no easy way to estimate how much all the lesser concerns will spend on additions, renovation and modernization, but one source offered the opinion that their total might reach $100 million over the 1945-60 period.

Oil Chemicals Abound: More oil is entering the U.S. via the port of

DRUG RESEARCH, PETROCHEMICALS: Sharp & Dohme lab at West Point, Sun Oil at Marcus Hook, Pa.

Philadelphia than by any other port; and the pace at which the area's oil refining companies have been adding to their operations here suggests that increasing quantities of Near East oil are due to move up the Delaware in the future. During 1955 alone, petroleum industry expansion and modernization in Greater Philadelphia will amount to $150 million.

After processing, refined oil products move out of the Philadelphia area to all parts of the world. According to the Philadelphia Oil Industry Committee, refineries in the 11-county area will handle more than 10 billion gal. of crude oil this year and ship out more than $24 million worth of refined products.

A rising proportion of those refined products are petrochemicals. An outstanding example: Sun Oil output at its new $15-million petrochemical plant at Marcus Hook. This plant is to produce annually 19 million gal. of benzene, 19 million gal. of toluene, and 15 million gal. of mixed xylenes.

This, of course, is a far cry from the comparatively simple process operations carried out by 19th century chemist Harrison and the lamp oil refiners. Philadelphia's process industries have grown tremendously bigger and more complex; but they're still based on the tidewater and markets that were a formula for success 149 years ago. And—to judge from current expansion plans of many of the nation's largest chemical and oil companies—that same formula looks equally promising for the future.

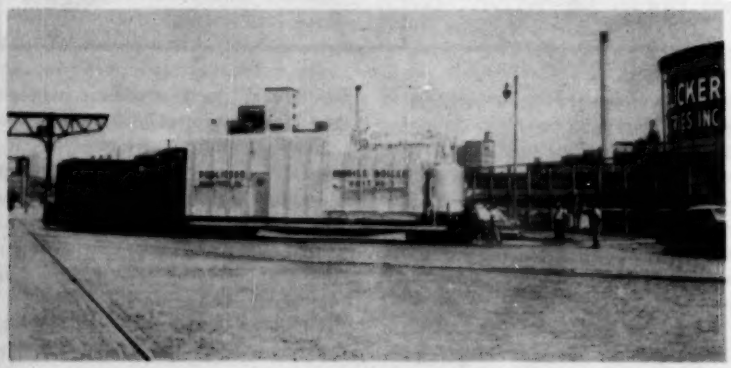
GREATER PHILADELPHIA: How Big, How Busy?

Area of 11 counties (three states)	4,565 sq. miles
Population of 11 counties	4,171,000
Population of Philadelphia (1950)	2,072,000
Employment in Philadelphia manufacturing plants (June '55)	547,200
Average hourly earnings of production workers in Philadelphia manufacturing plants (June '55)	$2.17

COMMERCE AT DELAWARE RIVER PORTS (1951):

Burlington-Florence-Roebling, N.J.	1.3	million tons
Penn Manor, Pa., and vicinity	3.4	" "
Philadelphia Harbor	42.4	" "
Camden and Gloucester, N.J.	2.9	" "
Chester, Pa.	1.1	" "
Marcus Hook, Pa., and vicinity	18.6	" "
Paulsboro, N.J., and vicinity	12.3	" "
Wilmington Harbor, Del.	2.1	" "
Pennsgrove-Carney Point-Deepwater Point, N.J.	0.5	" "
Other ports	1.2	" "
Total, Trenton to the sea	85.9	million tons

POLYESTERS, SOLVENTS: Du Pont's Repauno plant at Gibbstown, N. J., Publicker in Philadelphia.



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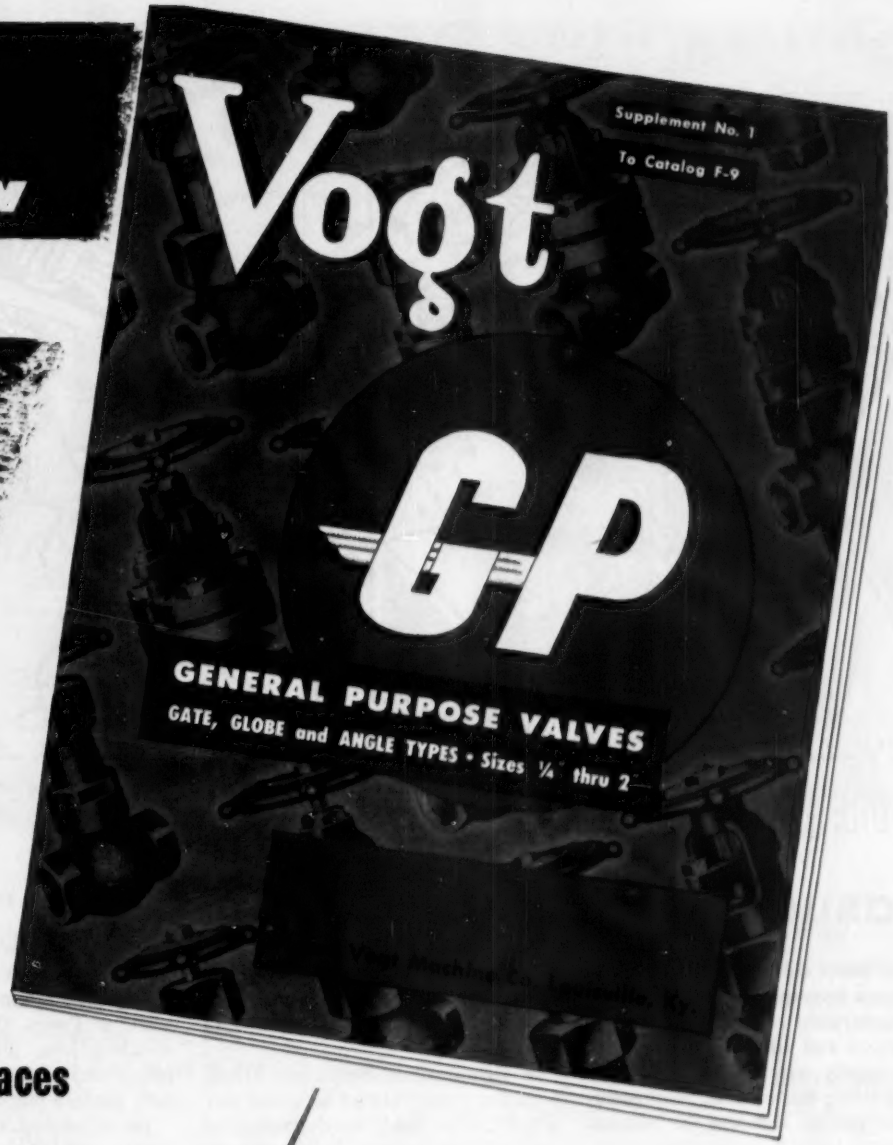

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BEFORE | **An employee usually casts only a cursory glance at his technical contract.**

AFTER | **The 'harmless slip' of white paper can come home to haunt him . . . in court.**

Casualness Can Be Costly

Like sweet cider that turns to vinegar when improperly handled, technical employment contracts can sour on employees and employers alike when not properly watched. An important case pending this week in court points up the pitfalls that can be encountered.

For the most part, both job seekers and potential employers tend to underplay the importance and consequences of technical employment agreements. Chief reasons: job applicants too often regard them as necessary formalities, sign them without a flicker of interest; employers (caught in a severe manpower squeeze) hesitate to frighten off likely job candidates by overemphasizing their importance.

By this careless disregard for contracts, trouble is courted by all parties concerned.

What They Say: In general today, most employment contracts, which technical personnel are asked to sign before clinching a new job in the chemical process industries, state:

- Starting salary compensation.
- Restrictions imposed by the confidential nature of company activities. (Special stress is always placed on postemployment secrecy required of ex-employees.)
- Termination conditions. (Here, bans are usually placed on actual geographic areas inside which ex-employees may not operate for specific periods of time—usually around two years.)
- Patent and invention consignment obligations.

More often than not, employees leaving a job don't run afoul of such conditions after severing company relations. That's because they either: (1) obey contracts to the letter, or (2) avoid taking jobs in similar areas of employment with competitors.

Sometimes, however—through carelessness, oversight or outright disregard of contracts—violations are committed. And then a bitter and costly court case may result.

Recent Court Cases: Just this year, some important breach-of-contract court decisions have been handed down on technical contract cases. Top among these: the conflict between Carter Products vs. Colgate-Palmolive *et al.*

In this instance, Carter Products contended that one of its research consultants, retained on development work at Foster D. Snell, Inc., later switched jobs, disclosed to a competitor secrets that his contract specifically pledged him not to reveal.

In upholding Carter's claim, the court restated a well-established breach-of-contract principle: ". . . a third party that uses trade secrets of another . . . which have been obtained through breach of a confidential relationship . . . is liable equally with the one who makes the breach."

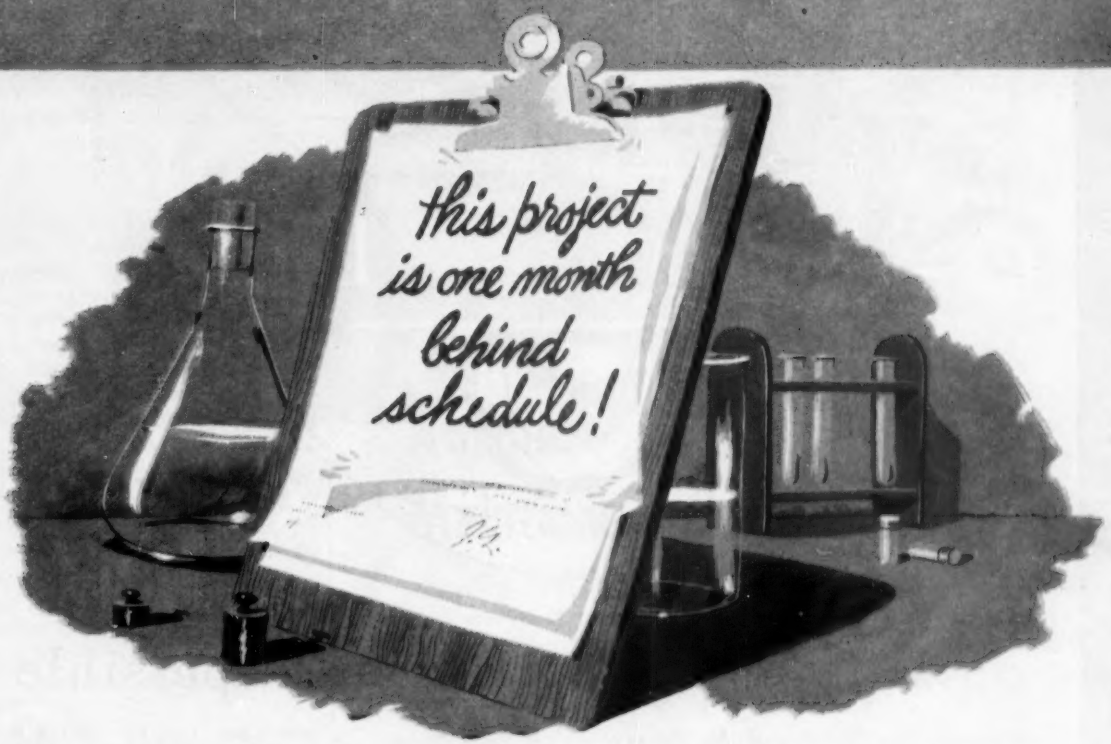
Current status of this costly suit: Colgate has appealed the decision, must still fight it out in a higher court.

And if you want further proof of the dangers involved, there are abundant additional examples.

One is the recent case, decided in the Indiana State Supreme Court, concerning a technical contract ban on geographic area of employment after severance.

Permacel Tape Corp. (a Johnson & Johnson subsidiary) tried to restrain William Donahue, a former employee,

...is this *your* predicament?



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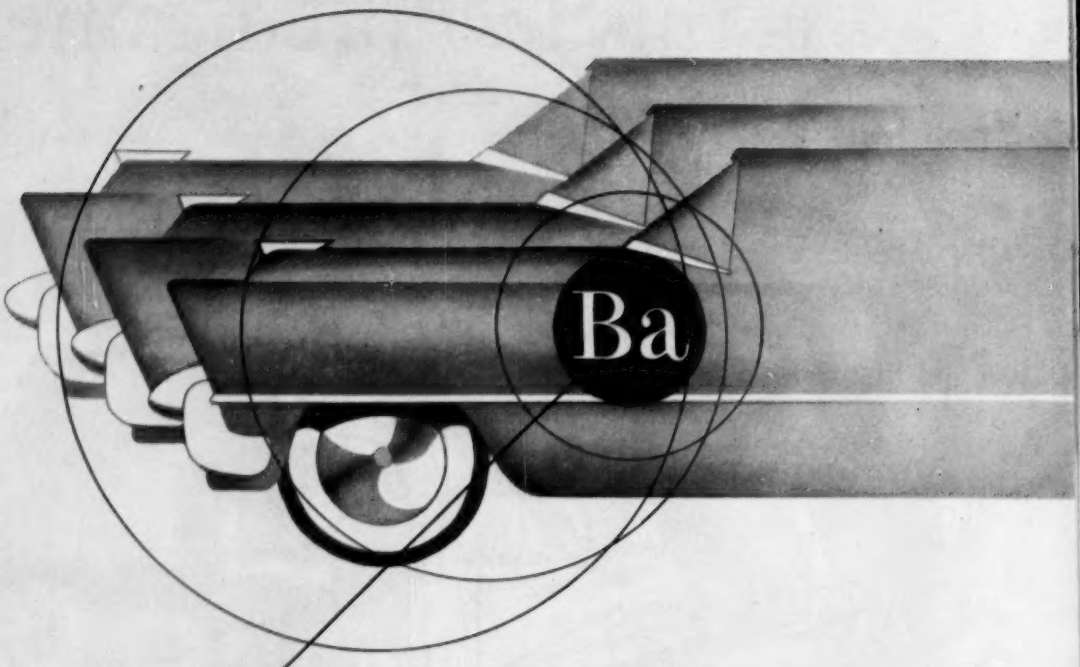

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from working for a competitor (doing business in the U.S. and Canada) when his contract specifically forbade such an act after termination of employment.

But, said the upper court in upholding Donahue: "Knowledge, skill and information (except trade secrets and confidential information) become part of the employee's personal equipment. They belong to him as an individual . . . therefore on terminating his employment he has the right to take them with him . . ."

Obviously, Permacel, in pursuing the case further* must prove that Donahue has special information and trade secrets that could harm the company if made available to a competitor.

Companies On Guard: Knowing that breach of employment contracts can create trouble all around, how are chemical companies seeking to minimize the danger of exposure?

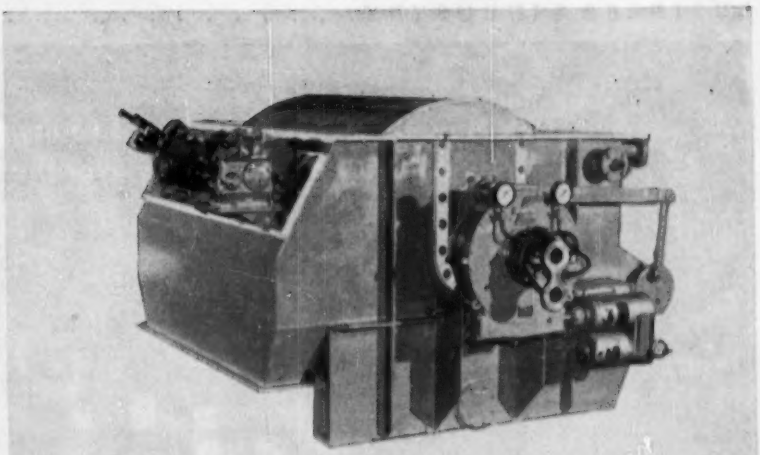
For one thing, larger firms today tend to feel one another out before hiring key manpower. Often a simple telephone call or a letter before finally sealing a new contract with a prospective employee can save future litigation.

One example of such precaution: Foster D. Snell in the last year has granted four key employees an official okay to leave the company's employ even though it meant a violation of contract. "We're not quibbling," says a company spokesman, "as long as employees and prospective employers clear with us first." Snell feels that while it has the right of voicing objections beforehand, once all moot points have been ironed out, no complications should arise later in the game.

In general, most chemical companies tend to be more than reasonable when it comes to waving contracts. "We feel," says one top company executive, "that employment contracts are really gentlemen's agreements, even though they're written." He adds, "In most cases ethics will dictate, both for the employee and for the company hiring him, what action to take."

But the fact remains, the technical employment contract can be a wolf in sheep's clothing—turning in a twinkling to snap the party of the first part or the party of the second part.

* Which it is now in process of doing.



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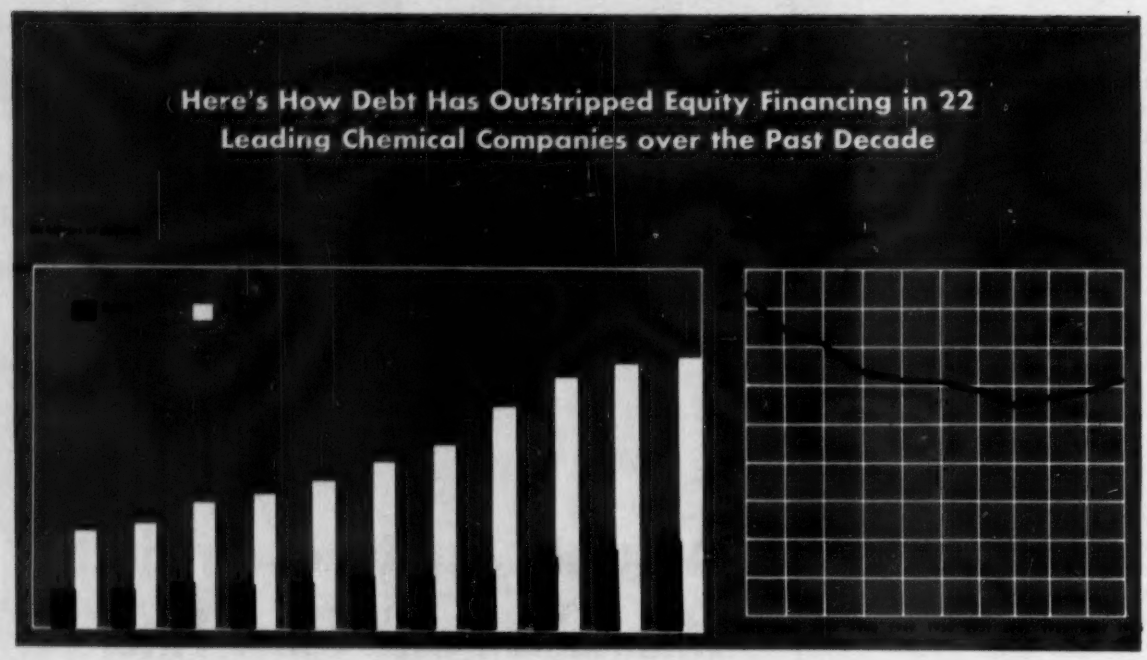

Swing Toward Equity

What is the most expendient means of financing expansion today? It's all Uncle Sam's currency, but what is the best method of paying for necessary expenditures—for the average chemical company?

Strictly from the record (*see table*), it would appear that most chemical firms over the past 10 years have leaned heavily in favor of liability (debt) financing.

But many financial back-seat drivers now maintain that the pendulum is starting to swing in the direction of equity financing again. Chief reason: earnings this year for most chemical process firms will reach an all-time high; with more retained capital available (and the money market tight), a number of firms that formerly resorted to long-term bank loans or preferred stock offerings will turn to available cash to hike production capacity.

Here's an example of the kind of thinking regarding financing that is going on today:

"In the past decade," points out one company treasurer, "the break-even point of business rose so high so fast that it was virtually a necessity for the average chemical company to go into debt to do enough business to avoid red ink."

Coupled with this almost-mandatory enlargement of manufacturing facilities (caused in large measure by the high rate of corporate taxation) was another influence—the higher cost of raw materials. "Gradually, today," he continues, "the gap is narrowing; taxes are still high . . . but sales are now increasing faster than the cost of basic raw materials."

Telling Side Effect: The current taxation pattern in the U.S. is also rapidly wiping out the individual (or family) as the sole owner of a company.

Whereas, some few years ago, there were several privately held major chemical firms in the U.S., there are only a handful today. And those companies, which up until their first common stock offering had strictly resorted to borrowing for expansion, are finding their offerings snapped up in a strong bull market.

"This trend," comments one company president, "is virtually sure to continue. The holdouts—companies with no debt or preferred stock outstanding—are becoming extinct. Within another 10 years, they should have become an economic curiosity."

No Rule of Thumb: For the company trying to decide whether it should seek senior or equity capital, there is no easy answer.

"Once any board of directors has decided it needs money for expansion," admits one executive vice-president, "a whole host of factors come into play. It depends in part upon how much money is needed, how quickly it must be supplied, what the financial setup of the company is already, how soon the investment can be expected to pay off, etc., etc."

Timing is another important consideration. Whereas it might be an opportune moment on one occasion to attempt to secure a long-term unsecured loan, it might be far more wise, at another, to effect a public stock distribution.

Company treasurers, acknowledging the hazards of predicting financial trends, agree, however, that, all other things remaining equal, equity financing is likely to gain added acceptance by chemical firms over the next few years.

Companies included in tabulation: Abbott Laboratories, Air Reduction, Allied Chem. & Dye, American Potash, Atlas Powder, Commercial Solvents, Consolidated Chem. Ind., Diamond Alkali, Dow, Du Pont, Eastman Kodak, Freeport Sulphur, Merck, Monsanto, National Lead, Olin Mathieson, Pennsalt, Chas. Pfizer, Sun Chemical, Texas Gulf Sulphur, Union Carbide, Victor.

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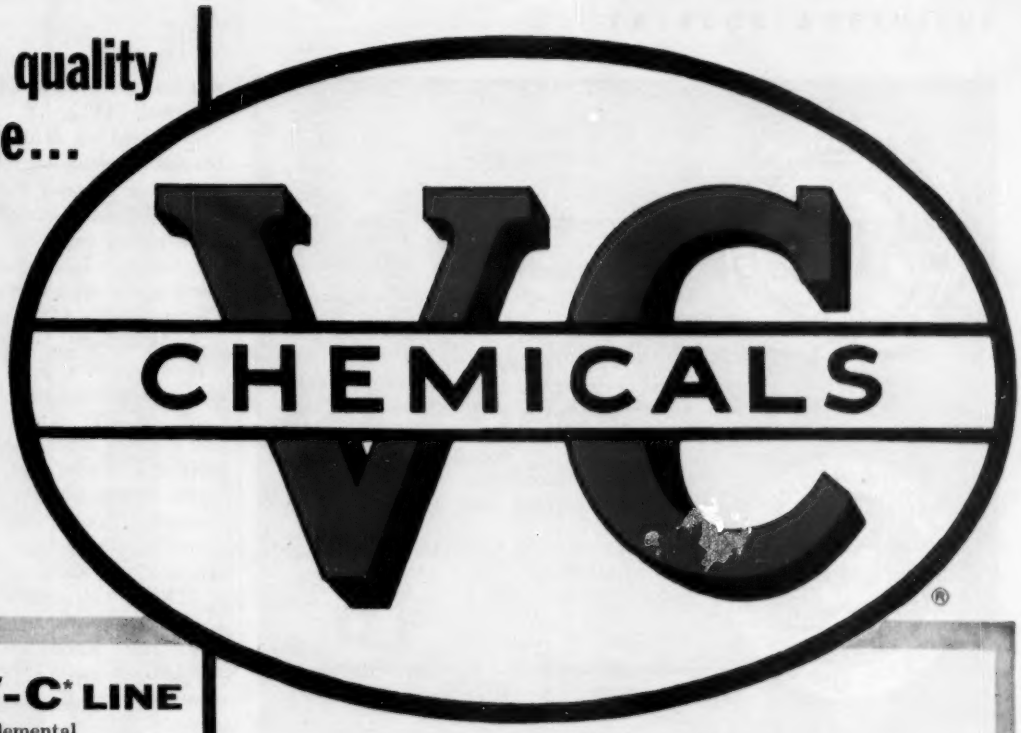

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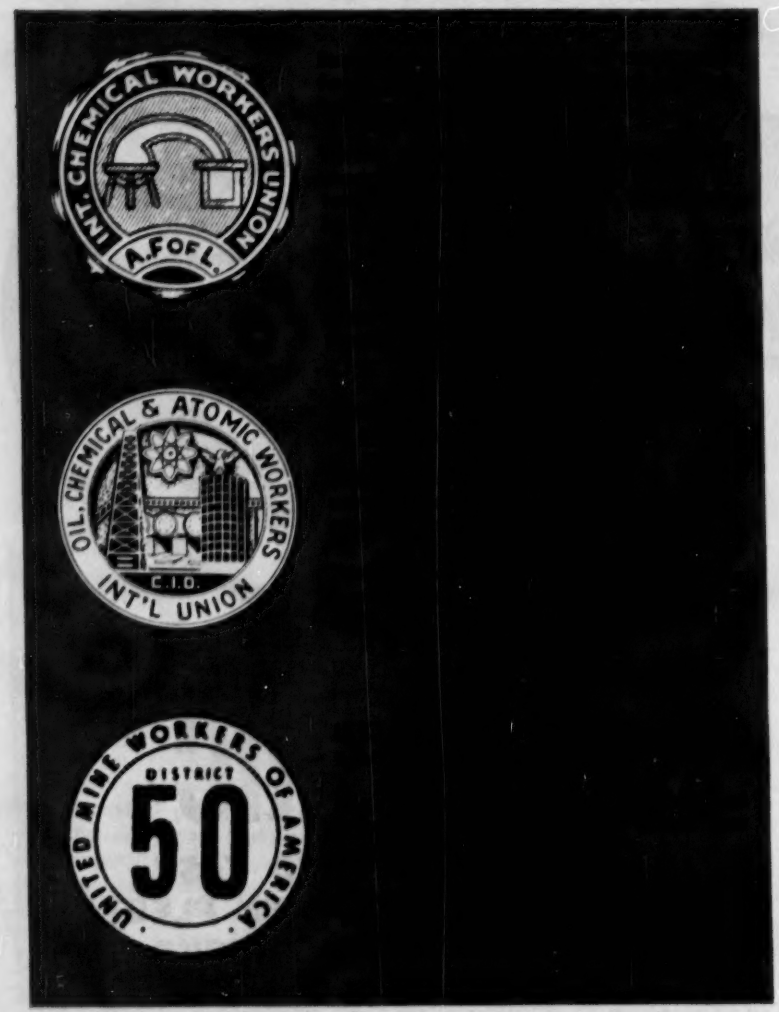

WHERE THEY STAND: On tariff controversy, chemical unions split . . .

2 to 1 Against Management

On world trade and tariffs—an issue that's vital to the whole industry—are chemical management and labor unions working at cross purposes?

As might be expected, there's no unanimity within either camp, so full accord and cooperation between the two groups are much too much to hope for.

But a *CW* survey this week of chemical unions' tariff views discloses a substantial divergence from the position generally maintained by chemical management. This makes for the kind of a stalemate situation in which Congress traditionally refrains from helping either party until they can agree on what they want.

One in Agreement: As a frame of reference, the unions' tariff stands are compared with the four-point summary of management's views (*box, p. 42*), which is based on recent statements by spokesmen for the Manufacturing Chemists' Assn. and the Synthetic Organic Chemical Manufacturers' Assn.

It's apparent that two of the country's major chemical labor unions are taking a markedly different outlook from that of management. They're enthusiastic about broad and sizable increases in foreign trade, and say they're not particularly worried about the consequences. These are the Oil, Chemical & Atomic Workers (CIO) and the International Chemical Workers Union (AFL).

The third big union in this field—District 50 of the United Mine Workers—takes a stand that's very close to that of management. This union's chief policy enunciator is vehement old John L. Lewis, who has pretty much given up on other nations as a big market for U.S. goods.

Backs Industry Spokesmen: Thus it happens that when MCA and SOCMA send representatives to Washington to testify on tariff bills, you're likely to find a UMW official backing up their testimony. Early this year, for example, UMW Vice-President Thomas Kennedy stood side-by-side with chemical management witnesses in opposing hasty and unamended passage of H.R. 1 (extending the Reciprocal Trade Agreements Act to 1958).

It's true, Kennedy acknowledged before the House Ways & Means Committee, that the U.S. chemical worker produces 2½ to 5 times as many units/hour as his European counterpart. But hourly wages abroad range down to less than one-sixth of the U.S. average, he went on; and hence this country's superior productivity is not a sufficient defense.

Kennedy holds that world peace depends "upon the strength and greatness of our own country," and he warns against any policy that tends "to build up industry in foreign countries at the expense of our own." He insists that national preparedness requires a high level of production in both the coal industry and the chemical industry. No important segment of either industry, Kennedy asserts, could be "put into mothballs and then taken out in full bloom in case of emergency."

Where It Pinches: The freer-trade sentiments of AFL and CIO chemical unions are not all-embracing. Both of these unions have set up their own "escape clauses," giving them leeway to support higher tariff rates whenever their own members are in danger of being laid off because of excessive imports.

But in general, OCAW and ICWU subscribe to the more internationalist doctrine. "We believe," says a resolution adopted by OCAW delegates last March, "that free world trade will strengthen the struggle of economically depressed countries. We cannot ignore

(Turn to p. 42)

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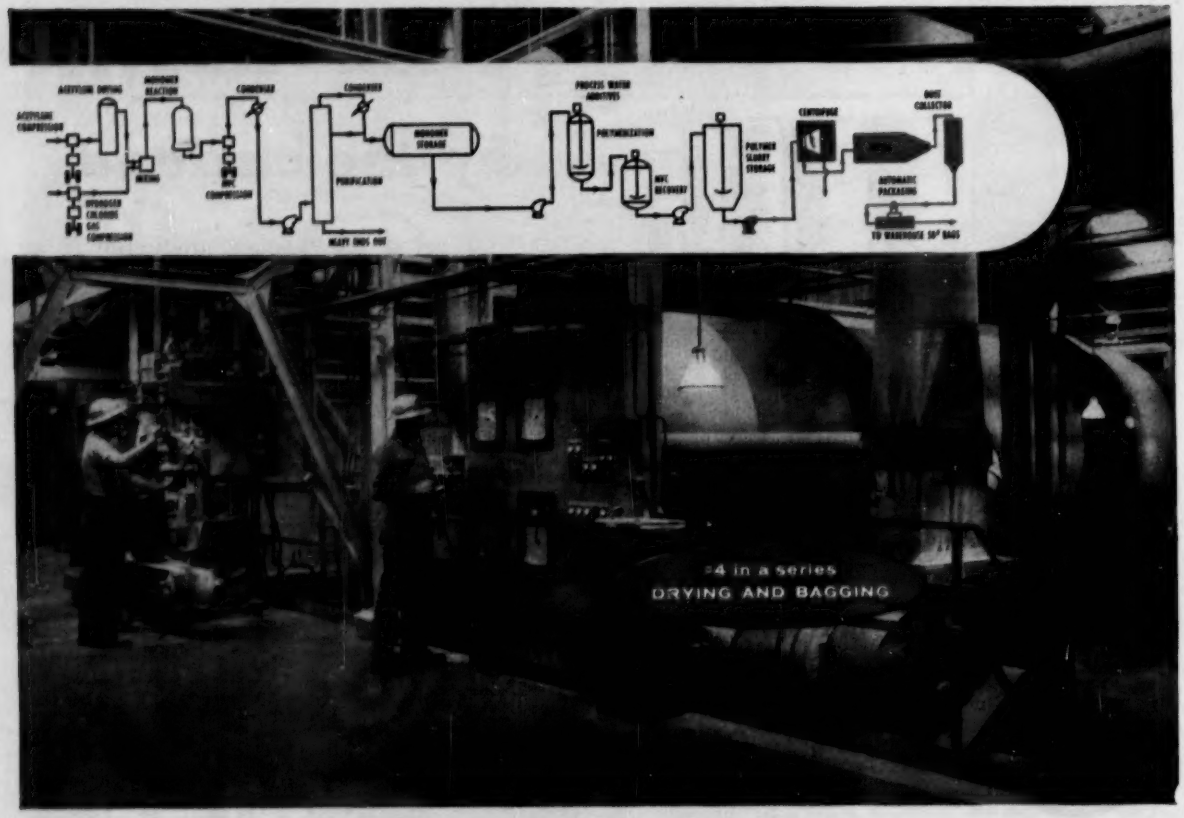

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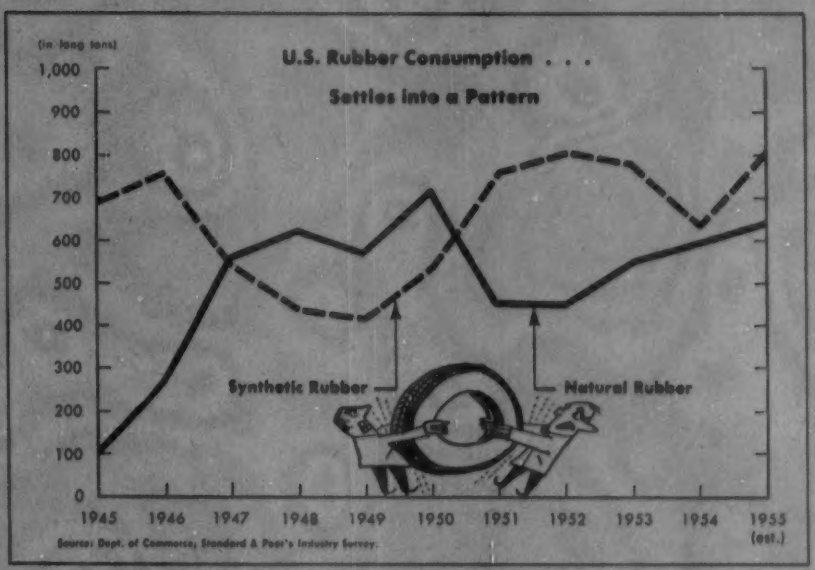
Charting Business

CHEMICAL WEEK

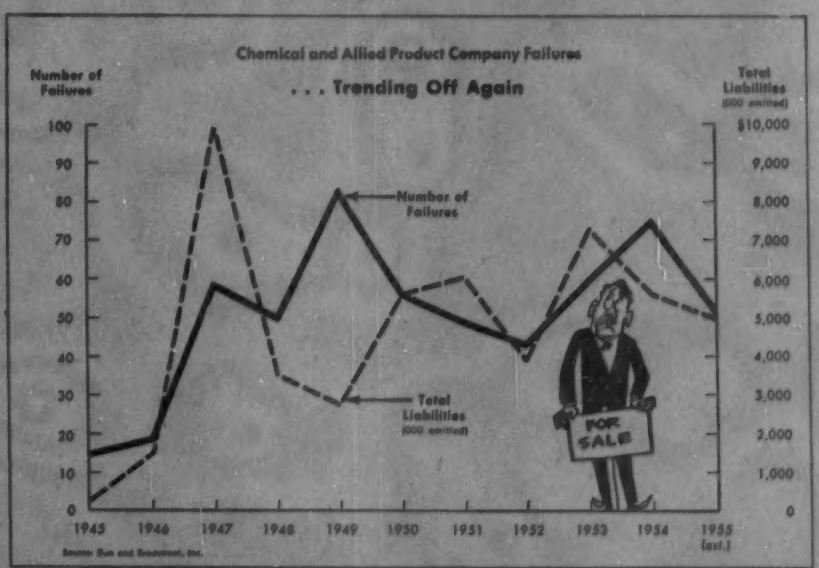
November 26, 1955



FACED with ever-growing demand for rubber, producers of natural and synthetic are today buckling down to the task of expanding capacity. Total consumption (of both natural and synthetic) is now estimated at 1.45 million tons this year in the U.S. alone; overseas demand is increasing by leaps and bounds.

Major impulse is admittedly the boom in automobile production. But producers claim that other markets are picking up now, too.

Outlook: a 2-million-ton/year market by 1960.

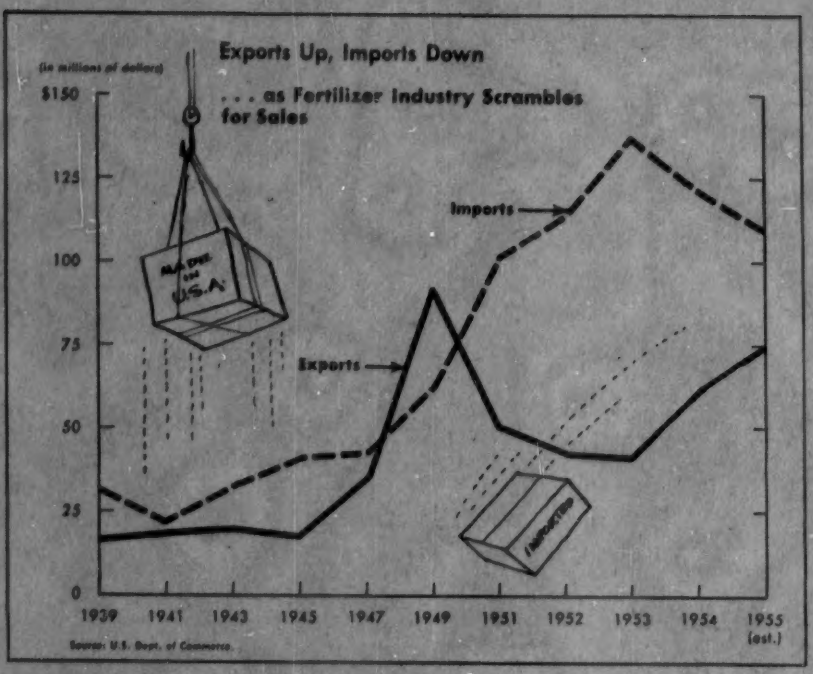


BUSINESS failures in the chemical and allied products industries are falling off this year, thanks in large measure to the healthy state of the U.S. economy. Failures, according to the Dun & Bradstreet classification, include those firms that have ceased operation following assignment or bankruptcy, attachment or a voluntary compromise with creditors. Liabilities include all accounts and notes payable, do not include long-term publicly held obligations.

Both should continue to drop in 1956, industry experts maintain.

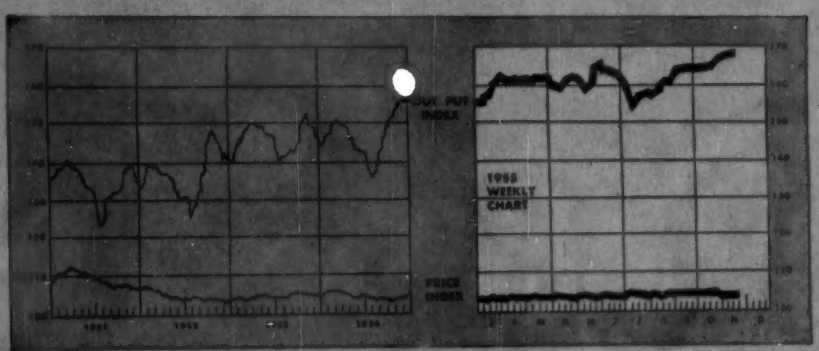
Charting Business

(Continued)



IN THE spirited battle for fertilizer sales, U.S. producers find themselves in a peculiar position this fall. The major U.S. fertilizer market (about 27% of the national total) is still in the South Atlantic states. But that market is also the one whose growth potential is most limited, and where competition is fiercest.

Hence, numbers of producers have been going overseas for new customers—and, for the first time since 1950 (when government-sponsored overseas shipments boosted export totals) exports and imports are nearly equal.



WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	168.3	168.9	155.9
Chemical Week Wholesale Price Index (1947=100)	104.7	104.7	104.2
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	494.8	386.1	336.1

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	119.0	118.5	114.5
Chemicals and Allied Products	106.5	106.0	106.9
Industrial Chemicals	118.9	118.2	117.7

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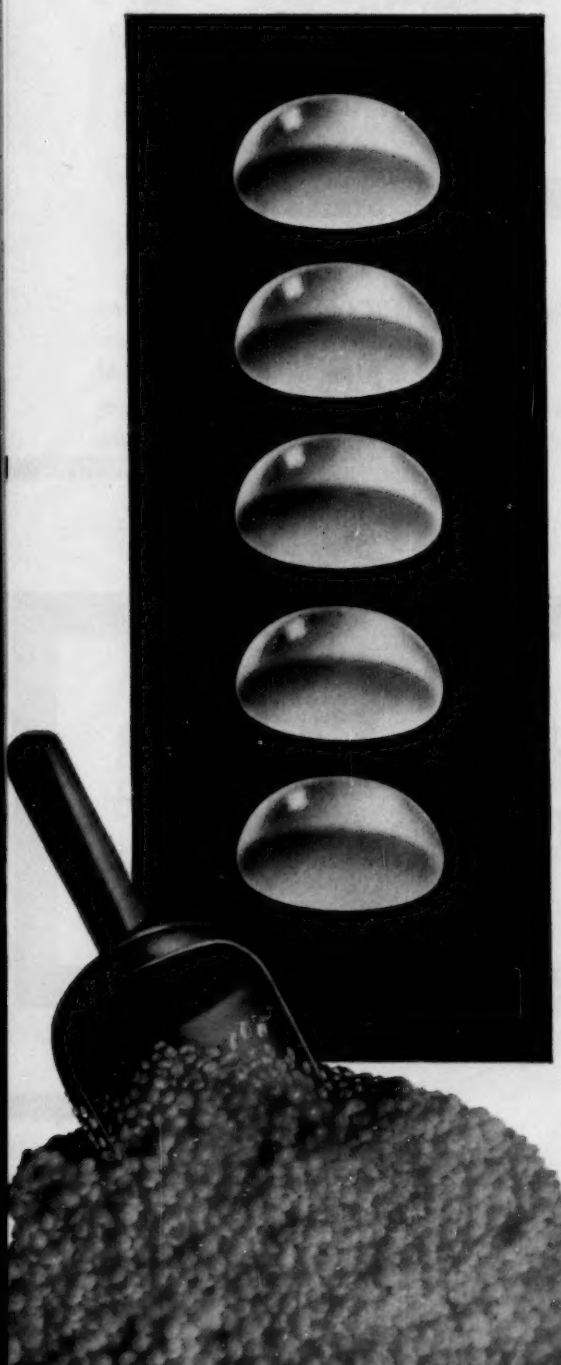

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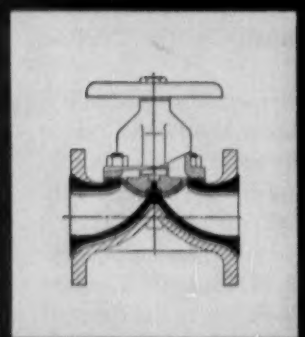
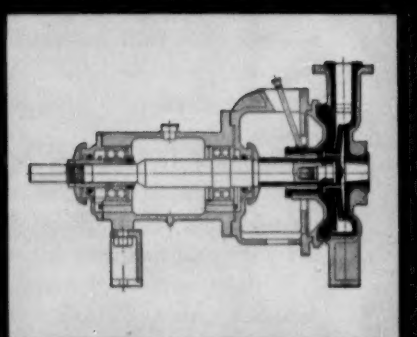
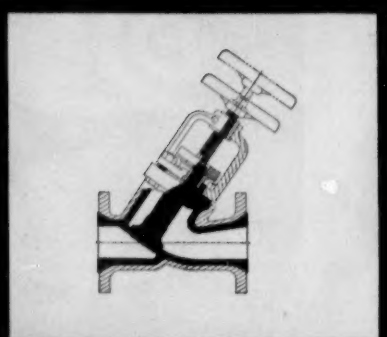
DURCON 1 and DURCON 2 are epoxy resins *modified* by an exclusive Durco process to increase corrosion and abrasion resistance. Two years of field tests demonstrate DURCON'S adaptability to organic acids, inorganics, solvents, alkalies and solutions of the halogen salts.







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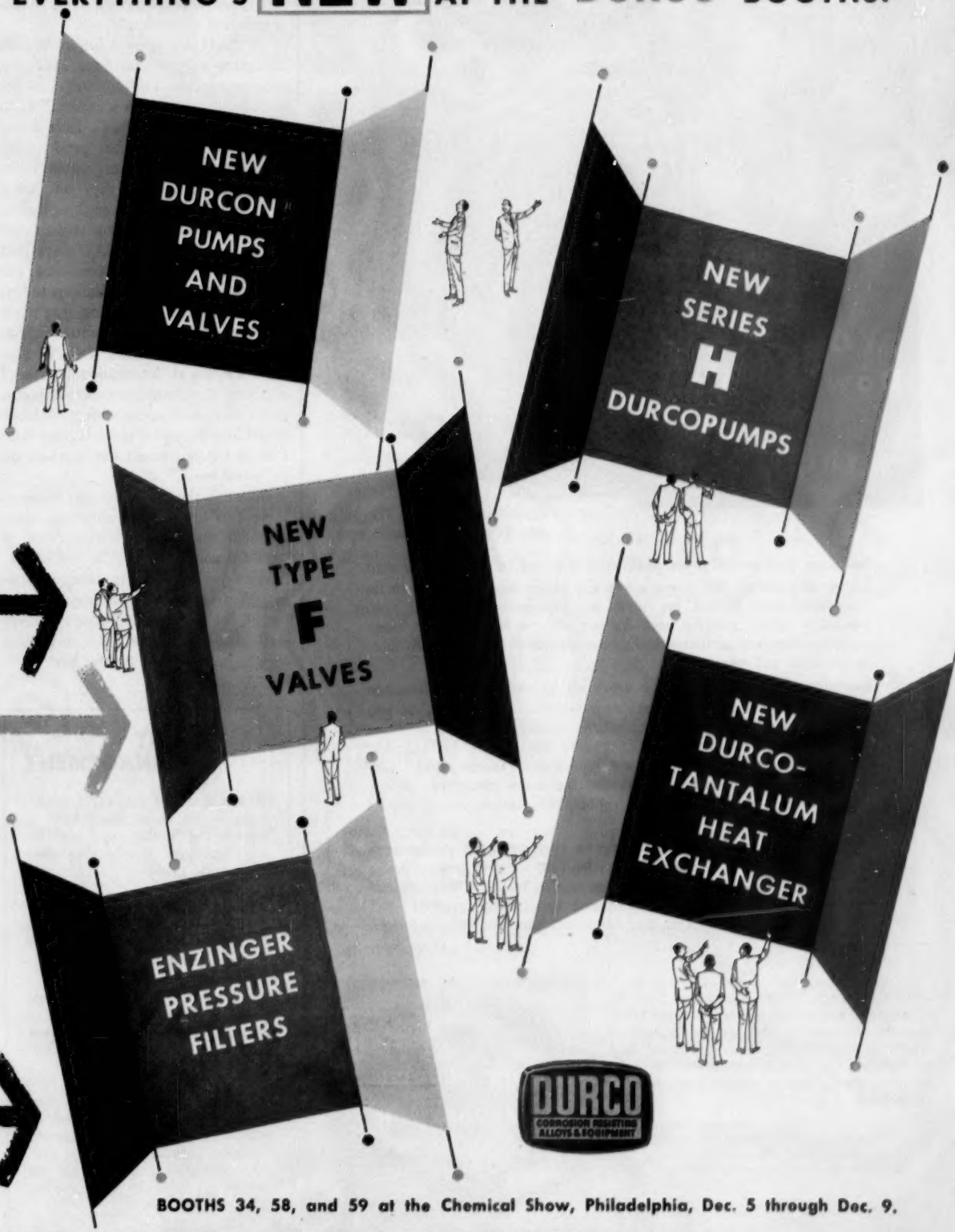

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and because everyone wants more comfort and protection. We invested years of research and development work to create silicone finishes for fabric and Sylflex† for use in tanning leather. These silicone products make your clothing, shoes and upholstered furniture shed water and water borne stains, feel better and stay new looking longer with less care.

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(*Continued from p. 34*)

the fact that undue restrictions on our part leave many countries no choice but to increase trade with Communist-dominated countries."

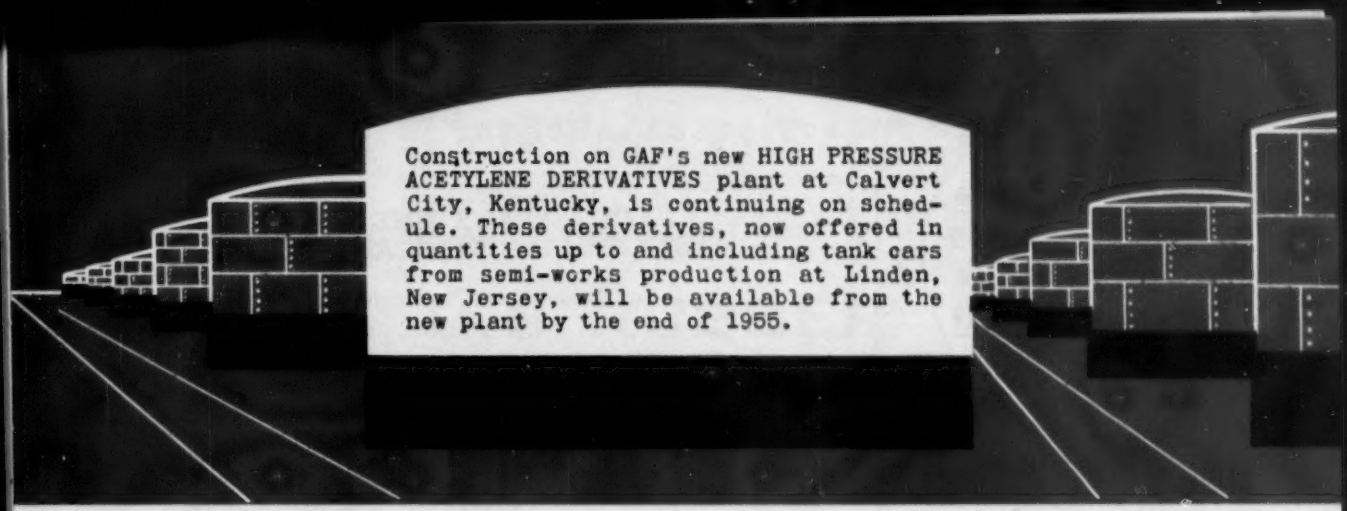
At the ICWU convention in August, delegates agreed that "the idea that we can protect our high wages in the U.S. by high tariffs is a fallacy." High wages here, says ICWU, have come about because of higher productivity and the strength of organized labor in the U.S. Productivity, not wage rates, is called the determining factor in the cost of producing chemicals.

Cartels Assailed: OCAW says that Communist-dominated countries are not the only totalitarian nations today, and turns thumbs down on free trade with so-called "free countries" that suppress human rights. OCAW also takes a swing at "international cartels," and says that "collective bargaining at home cannot compete with slave labor conditions abroad if these foreign substandard goods reach our markets on an equal basis."

So while there's agreement between these two unions and chemical management on some specific points, it would appear that OCAW and ICWU haven't yet accepted industry reasoning on what may be current problem No. 1 for the entire industry. Meanwhile, the industry isn't able to present a fully united front on the issue.

AS SEEN BY MANAGEMENT

- It's doubtful that tariff reductions would be of much help in closing the "dollar gap," stabilizing currencies, or achieving other diplomatic goals.
- Tariffs are needed to offset the unfair competition of substandard wage rates paid in most foreign countries.
- In any event, tariff reductions should be considered only on a highly selective, item-by-item basis, not by large groups of products.
- Accordingly, tariffs on key chemicals should be pegged at levels that will enable domestic companies to maintain the production capacity that might be needed for possible future industrial mobilization.



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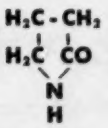

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Chemical Intermediate: Hydrolyzes to γ-aminobutyric acid. Reacts with acid anhydrides to form N-acyl lactams. Reacts with formaldehyde, ethylene oxide, P_2S_5, etc.

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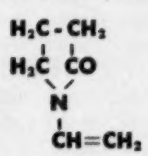

f.p. 13.5°C, b.p. 193°C at 400 mm. Flash point 209°F. Soluble in water, ethanol, ethyl ether, etc.

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WEST GERMAN CHEMICAL INDUSTRY

Has Scored These Production Gains
(in tons)

	Aug. '54	Aug. '55	Percent Gain
Sulfuric acid	142,570	150,333	5.4
Hydrochloric acid	12,520	13,388	6.9
Sodium carbonate	77,355	84,004	8.6
Chlorine	31,141	34,705	11.4
Caustic soda	42,079	47,954	14.0
Nitrogen	58,671	65,590	11.8
Nitrogenous fertilizers	59,318	68,917	16.2
Phosphoric fertilizers	42,702	50,025	17.1
Calcium carbide	71,292	81,959	15.0
Mineral and tar dyes	38,323	40,820	6.5
Paints and lacquers	24,762	28,516	15.1
Phenol	750	883	17.7

Still on the Upswing

West Germany's booming, bustling chemical industry is experiencing one of the most remarkable upswings in commercial history.

Its recovery, which started gathering momentum late in 1949, is still, apparently, under a full head of steam; there are no serious soft spots —an indication (to U.S. observers) that the pace will keep up, perhaps well past 1960.

Making the growth rate even more remarkable: all sectors of the West German chemical process industries have shared in the gains; all today are striving to keep production up to an ever-growing consumer demand; and virtually all claim their overseas market potential "has never been better."

Typical of recent developments scored by the West German chemical firms is that recorded by plastics makers. Plastics production in 1954 rose to 338,000 tons—second only to the United States in worldwide competition.

What's of even greater importance from the companies' view: sales in 1954 jumped 27% over 1953's record figures.

Exports in plastics, it's estimated, soared 70% last year—and should come close to emulating that record again this year.

Moreover, there's a noteworthy development to be seen from the fact that leading German producers of iron, steel and nonferrous metals are among those that have added capacity to the gains. There's a real trend in Germany today toward diversification —a trend that is being pushed with characteristic German thoroughness.

This could mean that a whole new group of major firms is arising—firms with which U.S. producers will have to reckon in the years ahead.

Whither Exports Next? One of the most vital factors of all to U.S. producers—the continued growth of West German exports—is registering new records this year, too.

Increases, to be sure, are primarily due now to increased sales to Asia—where U.S. firms are not a strong factor. But sales to North and Central America have also turned sharply upward in recent months. (Exports to North and Central America for the first six months of 1955 were valued at $32.8 million—a $7.1 million gain over the same period in 1954.)

Exports of West German chemicals to Africa (Jan.-June '55) came to $20.7 million; exports to Australia are steadily increasing—but still of no great importance to U.S. competitors.

Business with South America, is, in the words of German producers themselves, "the only major market sorely in need of resuscitation."

Exports to South America during the first six months of 1955 slumped about $5 million—to a total value of $23.8 million. (Brazil, for example, reduced her chemical imports from Germany by one quarter this year;

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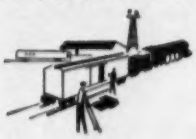
The United States Rubber Company today is America's foremost supplier of industrial synthetic fabrics. Our mills are the most modern, best equipped, most broadly experienced in the industry. With a new Textile Division laboratory at Winnsboro, S. C., our people can now make available to you the best facilities, anywhere, for experimentation, research and development of synthetic fabrics for use in the chemical industry. Our controlled distribution program, through distributors from coast to coast, assures you of inventory maintenance and immediate delivery  against orders. Products where you want them...when you need them.

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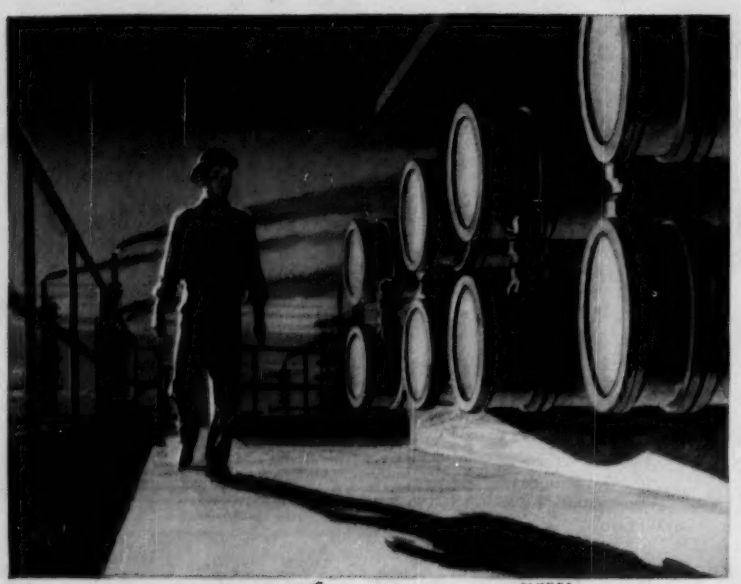
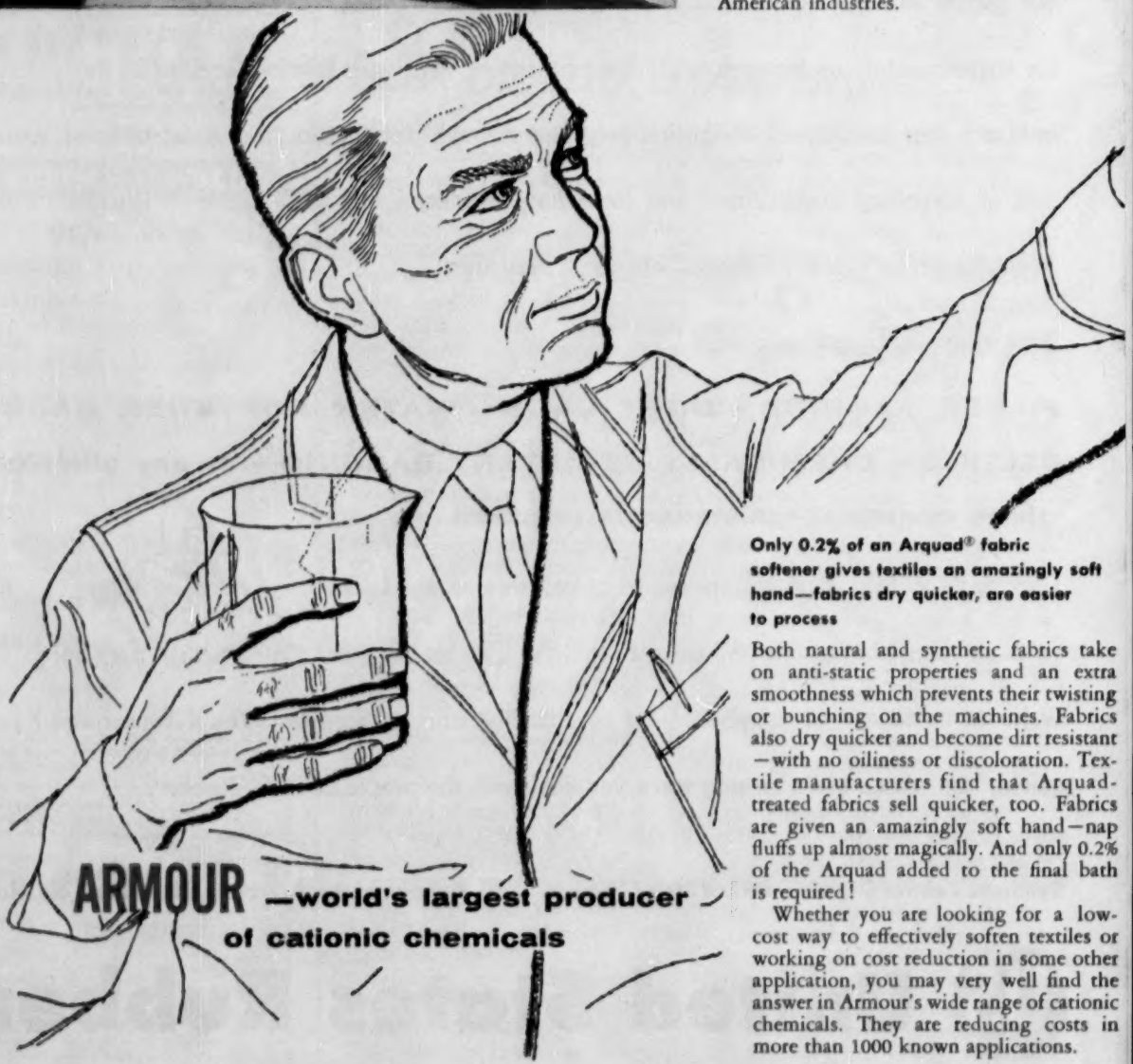


Minute quantities of an Armeen® stops corrosion in leading oil producer's equipment—increases throughput 20%

Corrosion residue, collecting in gasoline casing-head condenser tubes was creating a severe and costly problem for a West Coast oil producer just two years ago. Frequent shutdowns for cleaning were necessary. The corrosion rate was so high, condensers had to be replaced every 18 months. Then an Armour cationic corrosion inhibitor—one of the many Armeens—was put to work. Almost immediately, corrosion decreased 97%. Throughput increased 20%. Condenser life has been lengthened to 10 years. And less than one tablespoonful of an Armeen per tank wagon of gasoline did the job!

Armour makes over 100 cationics. Corrosion inhibition is just one of their 1000 known applications. Effective at low concentrations, they are increasing production and profits for a broad range of American industries.



Only 0.2% of an Arquad® fabric softener gives textiles an amazingly soft hand—fabrics dry quicker, are easier to process

Both natural and synthetic fabrics take on anti-static properties and an extra smoothness which prevents their twisting or bunching on the machines. Fabrics also dry quicker and become dirt resistant—with no oiliness or discoloration. Textile manufacturers find that Arquad-treated fabrics sell quicker, too. Fabrics are given an amazingly soft hand—nap fluffs up almost magically. And only 0.2% of the Arquad added to the final bath is required!

Whether you are looking for a low-cost way to effectively soften textiles or working on cost reduction in some other application, you may very well find the answer in Armour's wide range of cationic chemicals. They are reducing costs in more than 1000 known applications.

PRODUCTION PROBLEMS?
COST PROBLEMS?

Armour cationics solved both in these two widely diverse fields. New applications are constantly being developed and added to the hundreds already known. Perhaps these unique chemicals can help you.

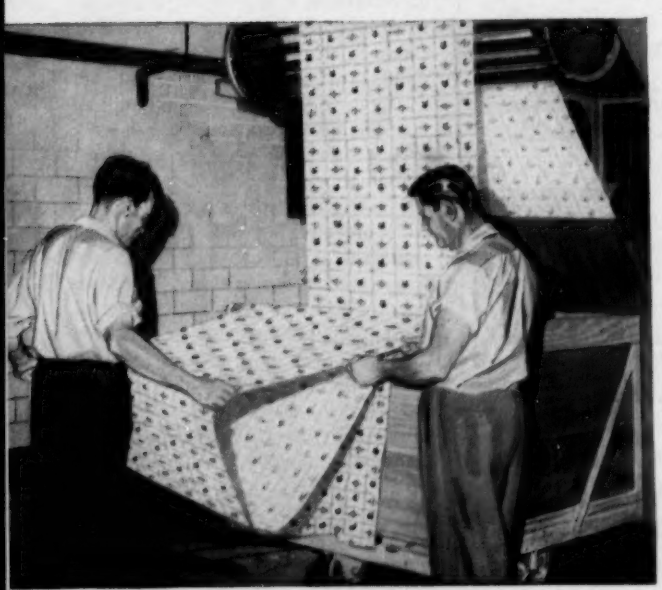
Whether your business is rubber processing or mineral recovery, paper manufacturing or petroleum refining—whether you make germicides, paints, plastics or products for many other fields—it will pay you to include Armour cationics in your testing program. Extremely low concentrations of these powerful chemicals are increasing efficiency and profits for industries in at least a thousand different ways. Today, there are more than 100 different Armour cationics. One of them may be the chemical you've been looking for.

Let Armour cationic specialists help speed your search. Our research people will recommend cationics which have delivered outstanding results in your field. Or, they will work with your staff to develop a profitable new cationic application for you. Simply write us a description of your problem or send the coupon below, today.

This brief list of proved applications will suggest many areas where testing of Armour cationics may prove profitable for you!

Anti-statics • Emulsifiers • Asphalt Additives • Textile Softeners • Corrosion inhibitors in water systems Corrosion inhibitors in oil systems • Pigment wetting • Bactericides • Hard rubber mold release agents Algaecides • Buffing compound additives • Vinyl mold release agent • Latex foam sensitizers Flotation reagents • Nitrile rubber plasticizers and softeners

For information on any of the hundreds of proved uses for Armour cationics—and for current data on possible new areas of application—fill in the coupon below.



MAIL THIS COUPON TODAY!

Please send me information on Armour cationics for the following applications:_____

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Name_____

Firm_____

Address_____

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ARMOUR CHEMICAL DIVISION

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CW 11

Here's how to Combine Simplicity and Economy in

Waste Treatment

Simplicity and relative economy sum up this unusual waste treatment installation for a large Southern paper mill. Primarily installed for suspended solids removal from general mill effluent, it is also doing a good job of B.O.D. reduction. The 300′ dia. Dorr Clarifier installed in an economical 500′ earthen basin removes approximately 90% of suspended solids . . . with a B.O.D. reduction of approximately 33%.

This Dorr Clarifier-earthen basin team is suited principally for use as a primary treatment unit. Additional treatment steps can be added as needed, without affecting the initial Clarifier installation.

If you have problems involving any phase of the separation of finely divided solids in suspension . . . or ion-exchange . . . or fluidizing techniques — chances are that Dorr-Oliver and its world-wide organization can help you.

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INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
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Argentina, by more than 50%.)

Taking serious account of the situation, German companies accede that they themselves are, in part, responsible for the decline. Soon after the war they rushed into South America, they admit, without demanding long-term contracts; and as a result, numbers of purchasers, tempted by low-price Japanese goods, failed to renew their German contracts this year.

That won't happen any more, however, if German producers can help it. Traditionally a chief German export market, South America will be sold—"in the old, tried and true methods."

"It may take a few years longer," states one major German exporter, "but the German chemical industry will methodically drive on South America—as they have driven to build Germany's chemical industry back to a position of world eminence.

All-Inclusive Summons

A new departure in enforcement of air pollution control laws is about to be tried out in Houston, Tex., where local courts have been humming with suits on this subject (*CW, Nov. 12, p. 28*).

In the case of Texas vs. Consolidated Chemical Industries, Inc., the state has filed an amended petition listing an additional 53 parties—including at least 20 chemical concerns and various other chemical process plants—as defendants.

This bulky group is said to include all companies that probably contribute to air pollution along the Houston Ship Channel. They're described as "continuous polluters," "intermittent but frequent polluters," and "intermittent but infrequent polluters."

A prosecuting attorney explained that it appears necessary to bring in all these defendants in order to attack the problem as a whole, even though management at many of the plants may have cooperated fully. The state now will present evidence that the court will use as the criteria for "separating the sheep from the goats."

In another air pollution action in Houston, the case against Best Fertilizer Co. was transferred to another court after Justice of the Peace Dave Thompson disqualified himself from hearing the charges. Thompson said he had complained about that plant himself.

Comparative figures show

METHYL ETHYL PYRIDINE saves you money

Compare the price and performance of CARBIDE's 2-methyl-5-ethyl pyridine with other pure pyridine type compounds—and you'll see that CARBIDE's MEP saves you dollars and cents. You're also assured of uninterrupted delivery in either small or large quantities.

Methyl ethyl pyridine is now used as a solvent and acid acceptor for the manufacture of vat dyestuffs; and as an intermediate for vitamins, pharmaceuticals, and vinyl pyridine type monomers. The unusual combination of strongly basic characteristics and low water solubility, suggests trial as an extraction solvent, resin curing agent, and intermediate for corrosion inhibitors.

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Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

Here are some MEP properties that will interest you—

Boiling Point (760 mm Hg)	178.3°C
Water Solubility (20° C) % by wt. in water	1.22
% by wt. water in	19.4
Ionization Constant (20° C)	2.7×10^{-8}

For further information on MEP, please send in this coupon.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto

CARBIDE AND CARBON CHEMICALS COMPANY
30 East 42nd Street, Room 308, New York 17, New York

Please send me ☐ a Sample ☐ Technical Data on 2-Methyl-5-Ethyl Pyridine.

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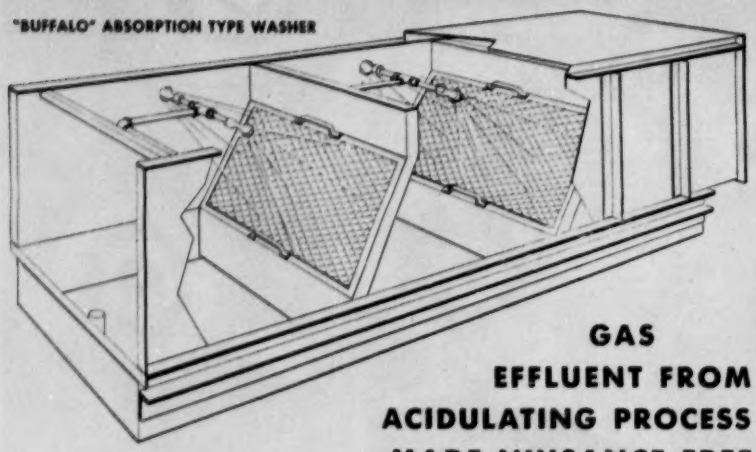
AIR CLEANING in the PROCESS INDUSTRIES

"BUFFALO" ABSORPTION TYPE WASHER



GAS EFFLUENT FROM ACIDULATING PROCESS MADE NUISANCE-FREE

—another tough problem solved by "Buffalo"

PROBLEM

The gases from an acidulating process had created such a disagreeable odor nuisance for blocks around the plant, that it became necessary to take immediate abatement steps. The exhaust contained high concentrations of glacial acetic acid and acetic anhydride.

SOLUTION

High concentrations, plus a desire to recirculate a neutralizing absorption liquor, called for a special "Buffalo" Absorption Type Washer. It contained two stages of wetted glass fibers for absorption of the acid vapors and a final dry glass fiber filter to prevent droplet carryover. Requirements for corrosion resistant materials of construction were considerably lowered by the use of neutralizing scrubbing liquids. Low initial cost, low pressure drop and flexibility of operation made this unit an ideal choice.

RESULTS

The gas was rendered completely nuisance-free and the installation earned the blessings of both authorities and neighbors. In fact, observers and workmen could actually stand in the effluent gases with no ill effects. Maintenance has proved to be simple and economical.

SEND US YOUR PROBLEM!

Above is just one of hundreds of specialized problems solved for every industry by "Buffalo" equipment and engineering knowledge.

WRITE FOR BULLETINS AP-525, AP-225 and AP-425

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WIDE WORLD

O'CONNELL: Pending White House move, acting chief of appeals court.

LEGAL . . . . . .

Heads Appeals Court: Now serving as acting chief judge of the U. S. Court of Customs & Patent Appeals in Washington is 74-year-old, Iowa-born Ambrose O'Connell, lawyer and former newspaperman who has been an associate judge of that court since 1944. As senior associate judge, he'll head this bench until President Eisenhower appoints a new chief judge to succeed Finis Garrett, of Tennessee, who resigned last summer.

•

Cosmetic Firms Accused: The industry-wide investigation by the Federal Trade Commission to see whether major cosmetics companies are complying with FTC trade practice rules (*CW, May 22, '54, p. 34*) bore its first fruit last week. FTC has charged that four leading manufacturers—Elmo, Inc. (Philadelphia); Hudnut Sales Co., Inc. (New York); Helena Rubinstein (East Hills, N.Y.); and Yardley of London, Inc. (New York)—are violating the Robinson-Patman Act by granting more liberal promotional allowances to some dealers than to others.

•

Patent Appeal Heard: Chemical process patent lawsuit developments:

• At Baltimore, the U.S. Court of Appeals spent a morning and afternoon listening to arguments on the pressurized shave cream patent suit that was decided early this year in

Multiplier of crop yields

Anhydrous ammonia offers a rapid and economical means of raising the nitrogen level of the soil. Corn growers, for example, report that for each dollar's worth of anhydrous ammonia (properly applied), they can expect a yield of as much as five extra bushels of corn.

The Atlantic Refining Company is a prime source of supply for many companies using anhydrous ammonia. For detailed information on this and other Atlantic petrochemicals, write the Atlantic office nearest you. The Atlantic Refining Company, 260 South Broad Street, Philadelphia 1, Penna.

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Early in 1956

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AIR REDUCTION CHEMICAL COMPANY

A Division of Air Reduction Company, Incorporated
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Represented internationally by Airco Company International

favor of Carter Products (*CW, Feb. 12, p. 15*). Colgate-Palmolive insists that it hasn't infringed Carter's "Rise" patent (2,655,480), and asserts that the trial court made a number of errors in deciding that the patent had been infringed.

• Commercial success is evidence of the utility and originality of a patent, a federal court declares in awarding judgment to the University of Illinois Foundation against F. W. Woolworth Co., Ammident, Inc., and Chester Henschel for alleged infringement of the foundation's Kesel and Wach patents for ammoniated dentifrices. The court said that licenses taken by eight major dentifrice makers—Colgate, Pepsodent, Ipana, Dr. Lyon's, Kolynos, Walgreen's, Rexall, and McKesson & Robbins—attested to the utility and invention of the patents.

LABOR . . . . . .

Bigger Wage Demands: Just before last week's meeting of the Oil, Chemical & Atomic Workers (CIO) executive board in Kansas City, Mo., the OCAW's 54-man bargaining policy committee got together in that city's Hotel Pickwick to chart tactics for next year's contract negotiations. While these plans are primarily for the union's oil refinery locals, President O. A. Knight indicates that OCAW locals at chemical plants are free to adopt this program if they want to. Details are not being made public, but Knight told CW: "Employers will find as negotiations begin that we will present arguments to justify wage increases considerably larger than industry has been offering in the past few years."

•

Jersey Drive Is On: OCAW is pushing an organizing drive in New Jersey chemical plants this fall. The union won a representation election at the Royce Chemical Co. plant at Carlton Hill, and is seeking to organize production and maintenance employees at Union Carbide's Bakelite works at Bound Brook. At present, Bakelite employees are members of the nonaffiliated Chemical & Crafts Union.

•

NLRB Post Script: The National Labor Relations Board has written a "p.s." to its decision on "plantwide"

Now, a Multi-Application High-yield Reducing Agent

MH LITHIUM ALUMINUM HYDRIDE

Versatile, Fast, Safe, Easy to Use

The news of a truly versatile reducing agent that is easy to use and has a wide range of high-yield applications is being received with great interest throughout the chemical processing industries. Lithium aluminum hydride, developed and produced by Metal Hydrides, has, in addition to its versatility, many other important advantages every chemist should know about. Take sixty seconds and review them.

Composition

Formula: $LiAlH_4$

Molecular weight: 37.94

Bulk Density: 2-3 gms/cc

Color, Form: Gray-white micro-crystalline lumps

Stability: Stable in dry air at room temperature

Solubility: Best in diethyl ether and tetrahydrofuran.

Here's Versatility

Using standard techniques and equipment, lithium aluminum hydride will carry out all the reductions described below at temperatures ranging from —80°C. to +100°C., depending upon the solvent used.

Acids

$4RCOOH + 3LiAlH_4 \rightarrow 2LiAlO_2 + 4H_2 + (RCH_2O)_4LiAl \rightarrow 4RCH_2OH$

Esters

$2RCOOR' + LiAlH_4 \rightarrow 1/2(RCH_2O)_4LiAl + 1/2(R'O)_4LiAl \rightarrow 2RCH_2OH + 2R'OH$

Aldehydes

$4RCHO + LiAlH_4 \rightarrow (RCH_2O)_4LiAl \rightarrow 4RCH_2OH$

Ketones

$4R_2CO + LiAlH_4 \rightarrow (R_2CHO)_4LiAl \rightarrow 4R_2CHOH$

Anhydrides

$(RCO)_2O + LiAlH_4 \rightarrow 1/2LiAlO_2 + 1/2(RCH_2O)_4LiAl \rightarrow 2RCH_2OH$

Acid Chlorides

$2RCOCl + LiAlH_4 \rightarrow 1/2LiCl - 1/2AlCl_3 + 1/2(RCH_2O)_4LiAl \rightarrow 2RCH_2OH$

Amides

$2RCONR_2 + LiAlH_4 \rightarrow 2RCH_2NR_2 + LiAlO_2$

$4RCONR'_2 + 2LiAlH_4 \rightarrow LiAl(OCH_2R)_4 + LiAl(NR'_2)_4 \rightarrow 4RCH_2OH + 4R'_2NH$

$4RCONHR' + 3LiAlH_4 \rightarrow LiAl(OCH_2R)_4 + 2LiAl(R'N)_2 + 4H_2 \rightarrow 4RCH_2OH + 4R'NH_2$

Nitriles

$2RCN + LiAlH_4 \rightarrow (RCH_2N)_4LiAl \rightarrow 2RCH_2NH$

Aldimines

$4RCH=NR + LiAlH_4 \rightarrow (RCH_2NR)_4LiAl \rightarrow 4RCH_2NHR$

Technical Data Available

Metal Hydrides sales engineers will gladly furnish all the further information you want promptly upon receipt of your request. If large quantities may be involved, a plant survey can be arranged with no obligation.

Mail this coupon on your letterhead

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☐ Send information on all Metal Hydrides Chemical Hydrides.

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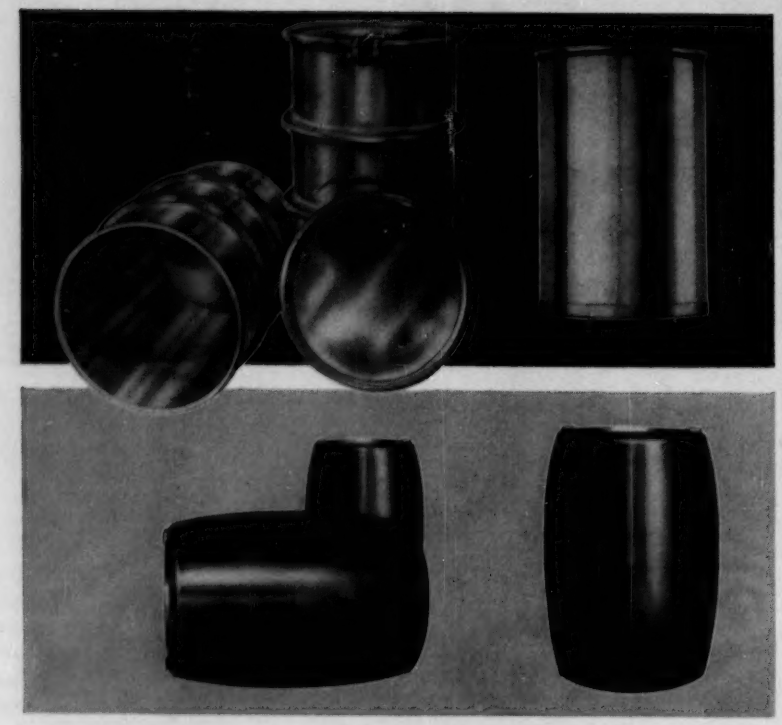

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Strong acids—delicate chemicals—perishable foods—flammable petroleum products—tacky printer's ink—whatever your problem product—it can be shipped safely and securely in one of the many Hackney returnable containers. Constant research into the problems of transporting and storing liquids and solids such as these is your assurance that you can always get the best possible container for your purpose from Pressed Steel Tank Company. Our more than 50 years' experience in developing and producing rugged, heavy-duty Hackney drums and barrels has resulted in a complete line of returnable containers that are durable, readily cleaned, easily handled, low-cost shippers.

Hackney returnable containers for every need—

Tight head or removable head types. Straight or bilged walls. Entirely seamless barrels formed from a single sheet of metal. Two-piece drums with a single, strong, circumferential weld. Three-piece drums with seamless chime and crevice-free interiors. Materials available to suit the requirements of your product—including steel, stainless steel, nickel, nickel alloy, aluminum. Various capacities, up to 55 gallons, or 110 gallons for some models.

The Hackney drum and barrel catalog is full of details. Send for your copy today.

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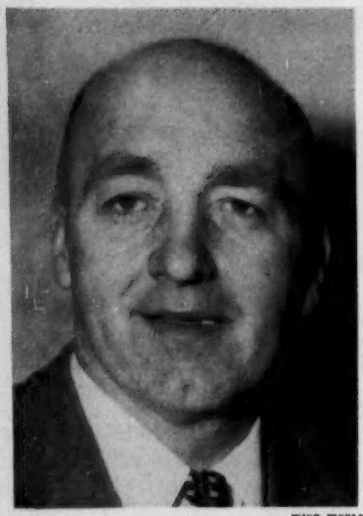


WIDE WORLD

NLRB'S RODGERS: To American Potash decision, a broadening P.S.

versus "craft" bargaining in the American Potash case (*CW, March 13, '54, p. 15*). In that case, the board ruled that AFL craft unions would be allowed to try to carve out small bargaining units—based on craftsman lines—in a plant whose work force previously had been represented by a single industrial-type union. Now—in decisions written by Chairman Philip Rodgers — the board is broadening that policy to permit craft unions to try to take over entire departments, including noncraft employees working alongside the journeyman electricians or other tradesmen.

•

GAW Pacts Seen Valid: Those Ford and General Motors contracts providing for a modified guaranteed annual wage are going to be valid despite the CIO's setback in the recent Ohio election, according to the United Auto Workers. Ohio voters turned down a proposal that would have made the state's unemployment compensation law the most liberal in the nation and also would have allowed unemployed persons to receive those state benefits while drawing layoff pay from a former employer. The Ford and GM plans are not to go into effect until they're cleared in states containing at least two-thirds of the firms' employees; but UAW says the favorable ruling by New Jersey Attorney General Grover Richman, Jr., brings the clearance figure to about 65%.

ADVERTISEMENT— *This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

Nov. 26 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1955

Polyethylene Coats Better When Applied As Liquid

High molecular weight polyethylene resins are reported to give excellent corrosion resistance when applied as coatings on metal surfaces.

Heat spraying equipment is available which reduces solid polyethylene to a low viscosity liquid before flame spraying so that coatings can be applied swiftly and uniformly at an average rate of 10 sq. ft. per minute. This method of application requires a target preheating temperature of 150-190°F, reportedly much lower than previous methods of application.

Resultant coatings meet strict U. S. Navy specifications for adhesion, porosity, corrosion, electrolysis, impact and thermal shock.

New AEC Sodium Handbook Now Available

The third edition of the *Liquid-Metals Handbook* was released on July 1 of this year by the Atomic Energy Commission and Department of the Navy. Designated as the *Sodium-NaK Supplement*, it is devoted entirely to liquid sodium and liquid sodium-potassium mixes (NaK). Subjects covered include: chemical and physical properties; heat transfer and chemical engineering; system design; components; safety and fire protection; and applications.

Also available: *Sodium Plumbing* by William B. Cottrell and Leland A. Mann—a review of unclassified research and technology involving sodium at Oak Ridge National Laboratories.

These books are highly recommended as supplements to U.S.I.'s own literature on handling of metallic sodium.

New Reforming Unit Assures Maximum U.S.I. Ammonia Production

At the U.S.I. ammonia plant — Tuscola, Illinois — a new Girdler reforming unit has just been completed as an alternate raw material source in the production of ammonia from natural gas. Until now the only raw material for U.S.I. ammonia manufacture has been hydrogen from the neighboring ethylene production facilities of subsidiary National Petro-Chemicals Corporation.

The new unit will supplement the available hydrogen when necessary to make it possible to operate the ammonia plant at full capacity at all times. This plant is rated at 50,000 tons per year.

Alkali Metals On Agenda At Spring ACS Meeting

A symposium on the "Handling and Uses of the Alkali Metals" is scheduled for the national spring meeting of the American Chemical Society in Dallas, April 9-13, 1956. Metallic sodium, potassium, lithium, etc. will come under discussion.

U.S.I. OPENS TWO NEW ALCOHOL DENATURING, DISTRIBUTION PLANTS

New Units At Newark, N. J. and Tuscola, Ill. Also Serve As Distribution Points For U.S.I. Solvents and Chemicals

Two new combination ethyl alcohol denaturing plants, bonded warehouses, and solvent distribution points have been added by U.S.I. during the past month. One is at Tuscola in central Illinois, the production point for U.S.I.'s synthetic alcohol; while the other at Newark, N. J., replaces a smaller denaturing operation a short distance away. These new plants, along with existing units at New Orleans, La., Anaheim, Cal., and Chicago, Ill. permit overnight and often same-day emergency deliveries to alcohol and solvent users throughout most of the country. Integrated facilities at all locations can supply pure alcohol, denatured alcohol, SOLOX® proprietary alcohol solvent as well as other chemical solvents, in straight deliveries or mixed shipments in compartment tank cars, tank trucks, box cars and trucks.

The Newark plant has a 10 million gallon per year rated capacity, and is designed to handle the large tank truck volume in metropolitan New York and Northeast U. S. areas.

The Tuscola unit, designed to serve the Midwest with a flexible 12 million gallon per year capacity, is in the existing U.S.I. plant area where sulfuric acid, ammonia and nitrogen fertilizer solutions are produced. It is located next to subsidiary National Petro-Chemicals' manufacturing facilities for synthetic alcohol, ether, ethyl chloride, polyethylene and other petrochemicals.

Because these plants handle all denatured alcohol formulations, physical layout of the plant insures that only the required denaturants are present in any batch. This is accomplished by providing a separate line for each denaturant, and the use of 12 denaturing tanks. Gravity flow system insures complete

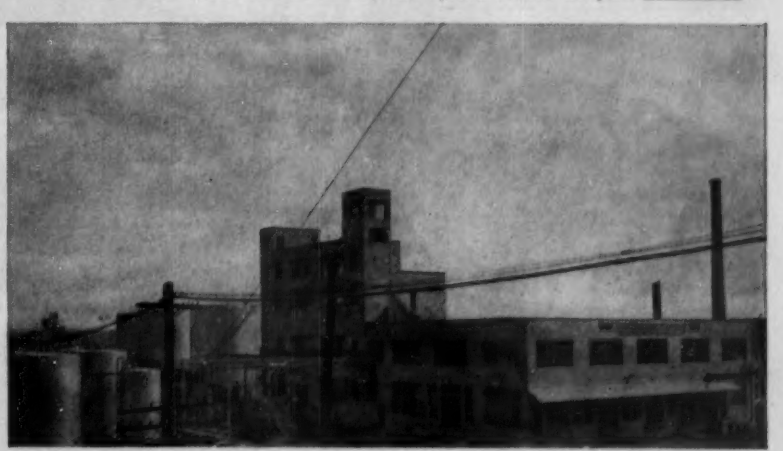
MORE

U.S.I. Offers Premixes, Feed Formulation Help

To keep pace with increasing demand of feed manufacturers for premixes, U.S.I. has expanded the scope of its nutritional services.

Vitamin and antibiotic supplements are usually added to the ration in small amounts — a time-consuming operation demanding careful attention, where slight measurement errors can prove costly. As a result, more and more feed manufacturers are buying USIMIX Premixes which contain vitamins, antibiotics, methionine and other additives in batch-size packages mixed to their specifications.

Also available: U.S.I. formulation service, offered to feed manufacturers on a confidential basis. U.S.I. will review feed formulations and offer suggestions.



New U.S.I. alcohol denaturing and distribution plant at Newark, N. J.

Nov. 26 ★ **U.S.I. CHEMICAL NEWS** ★ 1955

CONTINUED

Alcohol Units

drainage of all tanks and discharge lines. But with all of these built-in safeguards, chemical analysis of each batch is the final test. Years of application in other U.S.I. denaturing plants have proved the effectiveness of these methods of control.

Both plants have been designed to meet the pace of the fast-moving alcohol industry. Push-button control of the denaturing operation from a central control room permits quick preparation of formulas. Paper work delays are avoided by teletype connections between each plant and the U.S.I. sales divisions, a system which insures the best possible service for U.S.I. alcohol and solvent customers whose requirements were the governing factor in the design of these plants.

Permits, Bonds No Longer Needed On Sodium Ethylate

Purchasers of U.S.I. alcoholic solutions of sodium ethylate (15-20%) no longer need to file permit form 1485, nor do they need bonds to cover such purchases. The product can be sold only to firms using it in chemical processes and such firms will be required to submit to A&TTD, for approval, Form 1479-A in quadruplicate, stating the process and recovery and reuse of the alcohol.

Sodium ethylate is made by reacting sodium metal with anhydrous ethyl alcohol. U.S.I. supplies finished product and both raw materials.

"U.S.I. Isosebacic" Acid First Project For New Cincinnati Pilot Plant

U.S.I. has just completed a new half-million-dollar pilot plant building at its research site in Cincinnati, Ohio. The new building provides 15,000 sq. ft. of versatile plant space, air-conditioned control laboratories, and the necessary utilities for final testing of processes and products developed by the U.S.I.-National Distillers Research Department.

The research program is aimed particularly at the development of new products and processes which integrate with other industrial chemicals produced by U.S.I. and subsidiary National Petro-Chemicals Corporation. First product to be piloted in the new research building is "U.S.I. Isosebacic" acid, which exemplifies this research goal in that it is derived from both sodium and petrochemical sources. Evaluation quantities of the new material will be turned out, and the process, originally piloted at another location, will be polished up. Samples are now freely available to all interested researchers.

Preliminary work indicates that polyurethan flex-foams will provide a major outlet for this new dibasic acid. When made from "U.S.I. Isosebacic" acid, these materials seem to have more uniform cellular structure and excellent elasticity.

In the vinyl resins field, evaluations of compounds plasticized with esters of "U.S.I. Isosebacic" acid show an unusually high resistance to extraction by soapy water and oil.

National Distillers research laboratories in Cincinnati, O. New pilot building at right rear.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

New alkaline agent for stripping anodic coatings from aluminum eliminates waste disposal problem metal finishers encounter with acids. Water solutions at room temperatures remove average coatings by immersion only, in seconds. **(No. 1120)**

Spiral polyethylene tower packings now available show 140% increase in efficiency over other types, reduce packed height needed for separations. Liquid is held in interstitial spaces rather than on wetted surfaces. **(No. 1121)**

Edible gum for thickening water is now offered which gives viscosity of 3000 cp at 1% concentration, provides colloidal stabilization. One cent worth per pint makes a barely pourable solution, tasteless and odorless. **(No. 1122)**

New folder describes Flexspout® polyethylene closures on 5-gallon drums of U.S.I. ethyl alcohol USP, and U.S.I.'s proprietary denatured alcohol solvent SOLOX®. Illustrates how spout can best be opened and used. **(No. 1123)**

New organic brominating agent with 54% minimum bromine content now in commercial production. Costs less than other types, is somewhat more stable, and more reactive due to higher solubility in many organics. Gives high yields. **(No. 1124)**

Entirely new type of adhesive can be permanent or temporary, depending on requirements. Used for labeling polyethylene and other plastics, it replaces pressure-sensitive labels, can be applied by brush or existing machines. **(No. 1125)**

Specimens of 25 starches and condiments, on microscope slides, now available as standards in examining foods — and for quality control, research, litigation and criminology purposes. Hair and fiber specimens also available. **(No. 1126)**

Newly developed paper admits air, but resists passage of oil, water and other liquids. Manufacturer working on use possibilities. One suggestion — paper raincoats to shed water but keep wearer cool on hot days. **(No. 1127)**

New patent on sodium for making sodium cyclopentadiene listed as one of group of Ziegler patents on metal-organics now purchasable in translation. Patent gives 10 examples of convenient manufacturing procedures in detail. **(No. 1128)**

A polyethylene sink trap has been designed for laboratory use. This plastic resists acids, alkalis, fluorides and other chemicals; is physically tough and flexible. No tools required for installation, removal or replacing. **(No. 1129)**

PRODUCTS OF U.S.I.

ALCOHOLS:

Ethyl Alcohol (Ethanol)—Specially denatured—all regular and anhydrous formulas. Completely denatured—All regular formulas for industrial use, anti-freeze. Pure alcohol—USP 190°—Absolute, N.F., taxfree, taxpaid.

Butanol (Normal Butyl Alcohol)—Latent solvent for nitrocellulose, solvent for ethyl cellulose, many resins, many chemical syntheses.

Amyl Alcohol, Refined—Fine chemicals, pharmaceuticals.

Fusel Oil, Refined—Blend of amyl alcohols refined by chemical treatment, distillation.

Proprietary Denatured Alcohol Solvents

SOLOX®—General-purpose.

PILMEX®—Special, authorized for certain industries.

ANSOL® M—Anhydrous, special blend for lacquers, resins, etc.

ANSOL® PR—Anhydrous, special blend with higher ester content and solvency for lacquers, resins, etc.

OTHER PRODUCTS:

PETROTHENE® Polyethylene Resins.

Inorganic Chemicals: Ammonia, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sulfuric Acid.

Esters, Ethers and Ketones: Normal Butyl Acetate, Dibutyl Phthalate, Diethyl Carbonate, Diethyl Oxalate, Ethyl Acetate, Ethyl Ether, Acetone.

Intermediates and Fine Chemicals: Acetoacetarylides, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate solution, Urethan USP (Ethyl Carbamate).

Animal Feed Products: Calcium Pantothenate, Choline Chloride Products, Curbay B-G® 80, Special Liquid Curbay®, DL-Methionine, Niacin USP, Riboflavin Concentrates, Vitamin B_{12} and Antibiotic Feed Supplements, Vacatone® 40, Vitamin A, D_3 and K_3 Products.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Riboflavin USP, Urethan USP, Intermediates.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.

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WIDE WORLD

BROWNELL: Rebukes Small Business Administration for placing . . .

No Curb on Monopolies

In an unprecedented move last week, Attorney General Brownell accused the Small Business Administration of operating in "an indirect and haphazard manner," and failing to place enough curbs on "possible monopolies." His charge specifically criticized SBA for failing to determine whether firms getting loans and procurement benefits are dominant in their industry. It also urged Congress to resolve a dispute between the Defense Dept. and SBA over the percentage of military contracts going to small business.

In a detailed analysis of just what is wrong with SBA, Brownell made some of the precise charges that many small chemical process firms have been championing for several years. Among other things, he holds that:

- SBA's screening process, to exclude possible dominant producers from its program, is inadequate. "A more intensive individual check for eligibility is necessary."
- SBA investigators are not properly briefed or prepared to collect necessary facts from business applicants.
- Because of a disagreement between Defense and SBA over just what Congress intended small business to have as "a fair share of procurement contracts," small business is probably only getting two-thirds of the contracts it could have" were the matter resolved.

WHAT NEW WONDERS WILL HE DISCOVER?

His is a proud, rewarding profession. He produces new products for man's use and comfort. In so doing he creates new jobs, new factories, new ways of living.

Guaranty Trust Company is a long-time associate of our great chemical industry. This team working together—one supplying the scientific knowledge, the other sound financing—has been responsible for many a 20th century miracle.

May we put our banking facilities—and our knowledge of the financial needs of the chemical industry—to work for you?

Guaranty Trust Company of New York *Capital Funds $395,000,000*

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LONDON: 32 Lombard St., E.C. 3 · Bush House, Aldwych, W.C. 2

PARIS: 4 Place de la Concorde · BRUSSELS: 27 Avenue des Arts

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What's First in Odor Control?

"Alamask"®

EXCERPTS from monthly news bulletins sent by RHODIA to its sales and engineering staffs.

Alamask CPM-55-X

A large customer in the meat rendering industry will continue to use this product as they report it is the best reodorant they have worked with.

Alamask CPM

A synthetic fiber plant is using this to eliminate objectionable amine odors carried in process waste sewers. Results are quite satisfactory.

Alamask CPM-55

Customer reports this product has proven very satisfactory in neutralizing malodor of tanning operations, when used in a satisfactory concentration per 1000/1500 lbs. of hides tanning 50% mixture.

Alamask CY

Customer reports this product to be superior to other reodorants for reodorizing ground sponge rubber used as a stuffing for cloth novelties: i.e., Alamask CY masked the odor of the rubber without imparting an odor to the outside cloth used in making the novelties.

Alamask SPECIAL

Customer used this at 4 ozs./50 gallons, pad solution containing starch. Cotton fabric is dried at 280 F., then the starch processed cotton fabric is treated with a resin (urea formaldehyde). The presence of Alamask stops by-odors and customer is very happy with it.

• • •

These are but a few of the industries where ALAMASK has been used to mask obnoxious malodors. No matter what your industry or product, there is an ALAMASK to combat your odor problems. Our technical staff will be glad to show you how.

Rhodia INC. 230 Park Avenue New York 17, N. Y. Plant, Paterson, N. J.

In Canada: NAUGATUCK CHEMICALS, Division of Dominion Rubber Co., Ltd.
MONTREAL • TORONTO • ELMIRA • WINNIPEG

HERE'S HOW FRENCH CHEMICAL OUTPUT IS RUNNING NOW

(all figures for September, in metric tons)

Chlorine	14,000
Sodium carbonate	58,651
Superphosphates	90,000
Nitrogenous fertilizers	28,000
Calcium carbide	26,000

FOREIGN. . . . . .

Production/France: Overshadowed by the more spectacular advances registered by the West German chemical process industries (*see p. 44*), the French chemical industry is steadily regaining its prewar economic footing.

Particularly satisfying to government authorities: the recent gain in production of superphosphates—which jumped a full 16% in September over August's output. Making prospects even more encouraging: French chemical producers themselves now estimate that they can hike production another 15% next year.

•

Polystyrene / Japan: Official approval has been granted to Dow Chemical (Midland, Mich.) to invest 300 million yen in polystyrene production in Japan.

According to the Japanese Foreign Office, this is the first authorization to be granted under an agreement signed last year between the U.S. and Japan whereby the U.S. government guarantees the investment against specific risks. The investment covers:

- Provision of technical know-how (involving access to patents) valued at 100 million yen—in return for a share in Asahi Dow's increased capital.
- A further loan of 270 million yen—for general capital expenditures.

•

Fertilizer / Great Britain: Work starts shortly on two new fertilizer plants in the Thames estuary, England, as a result of an agreement reached by Shell Chemical Co., Ltd. (London) and Fisons, Ltd. (Felixstowe, Suffolk).

Cost of the two plants is estimated at $30.8 million.

Largest of the two, costing $18.2 million, will be built at Shell Haven in Essex, will convert refinery gases (or other hydrocarbons) from Shell's

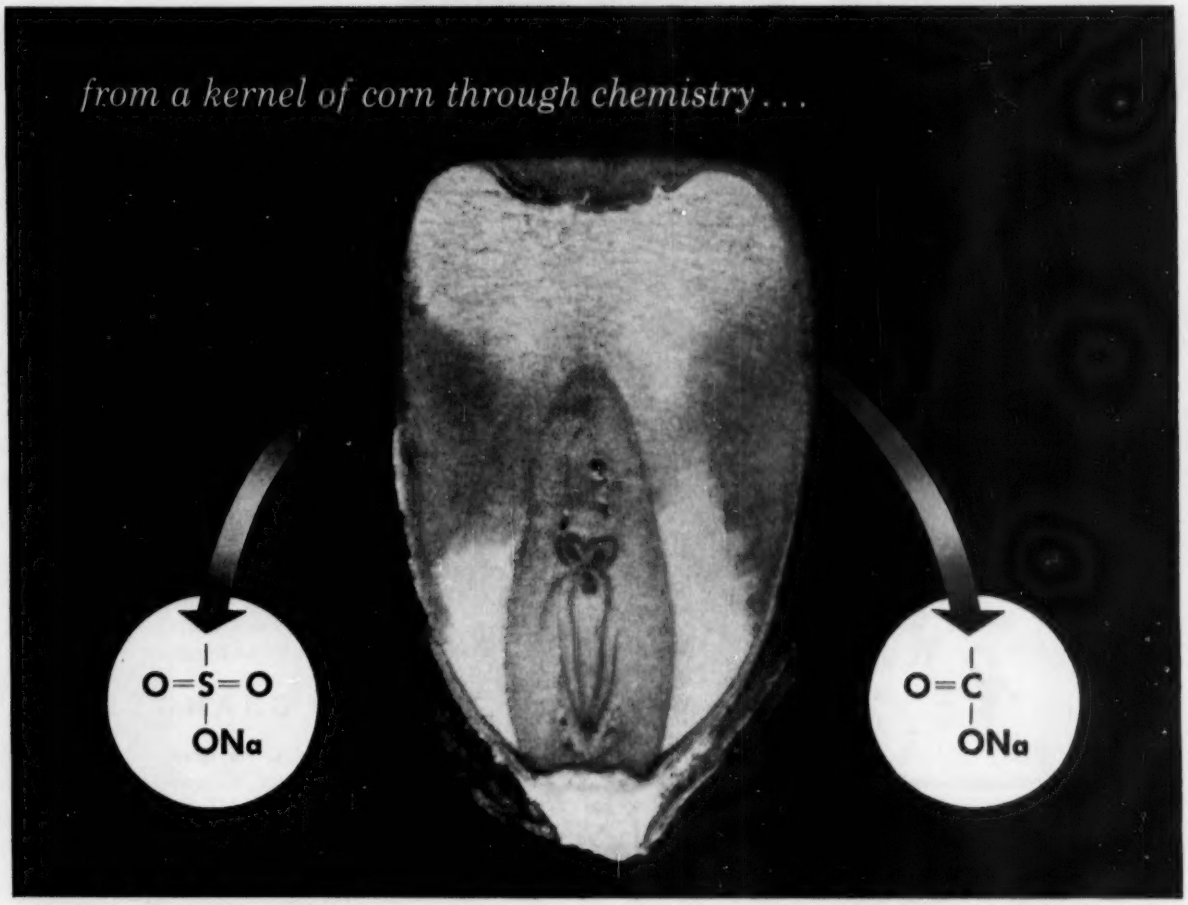

Photo courtesy of Corn Industries Research Foundation, Inc.

a STARCH polyelectrolyte

This unusual starch is National's NU-FILM. Some of its original hydroxyl groups have been replaced with carboxyl and sulfonic groups, as sodium salts. The result is a balanced combination of all three groups—and these unique properties:

- lower gelatinization temperatures
- increased hydrating capacity
- greater resistance to retrogradation
- good compatability with polyvinyl alcohol and gelatin
- improved rinsability
- higher soil and grease repellancy
- better freeze-thaw stability

It suggests these industrial uses:

- suspending agent
- stabilizer
- thickener
- sizing agent
- stiffener
- finishing agent

Would you like to know more about National's NU-FILM? Tell us about the use you have in mind. Our staff of starch technologists will be happy to work with you.

National
STARCH PRODUCTS INC.

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Bemis Multiwalls made with RUF-GRIP kraft handle easily . . . and stack easily . . . and stay stacked. Consequently, they ship and store better. Get the details from your Bemis Man.

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Also in the Bemis Family, Serving the Chemical Industry . . .

Waterproof (Laminated) Bags

Bemis

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Sales Offices in Principal Cities

B & I . . . . . .

refinery into ammonia and nitric acid. Planned output: 75,000 tons/year of ammonia; estimated date of completion: late 1958.

The smaller plant will be built by Fisons, Ltd., at a cost of $12.6 million. It will convert ammonia produced at Shell Haven into ammonia-based fertilizers.

•

Newsprint/India: An $11.5-million newsprint mill (known as Nepa Mills) has started production in Madhya Pradesh (Central India). It was built with the cooperation of the government of India, the state government of Madhya Pradesh, and the U.S. Technical Cooperation Mission.

By Jan. '56, officials estimate, the mill will be able to meet one-third of India's annual requirements for newsprint—and will save foreign exchange at a rate of $4.2 million annually.

KEY CHANGES. . .

Philip A. Singleton, to assistant to the president, Monsanto Chemical Co. (St. Louis, Mo.).

James E. Castle, to manager, Industrial Minerals Division, International Minerals & Chemical Corp. (Chicago, Ill.).

David W. Harris, to board chairman and chief executive officer, and **M. P. Venema,** to president, Universal Oil Products Co. (Des Plaines, Ill.).

James S. Smart, to assistant treasurer, Canadian Chemical and Cellulose Company, Ltd. (Montreal, Quebec).

F. B. Patton, to vice-president, Armour and Co. (Chicago, Ill.).

T. L. Lenzen, and **G. L. Parkhurst,** to directors, and **J. P. Bowman,** to assistant secretary, Standard Oil Co. of California (San Francisco).

Joseph Daffner, to vice-president, Norex Laboratories, Inc. (New York).

O. D. Blessing, to vice-president, Dow Corning Corp. (Midland, Mich.).

Peter G. Arvan, to assistant director, research, Inorganic Chemicals Division, Monsanto Chemical Co. (St. Louis, Mo.).

Ingrid C. Magnuson, to president, **Charles L. Novak,** to treasurer, and **Edward Magnuson, Jr.,** to assistant secretary, Magnuson Products Corp. (New York).

As solvents, the NP's present an unusual combination of properties. They are medium-boiling, mild-odored, and have strong solvent power for a wide variety of substances, including many coating materials, waxes, resins, gums, dyes and numerous organic chemicals. They have thoroughly demonstrated their usefulness in the formulation of nitrocellulose, cellulose acetate, cellulose triacetate and cellulose acetate butyrate lacquers and adhesives. They have also found use in specialty products based on various vinyl-type resins.

CSC's new Nitroparaffin plant at Sterlington, La. is now in full production. Additional facilities for increased volume of NP derivatives are nearing completion.

8-PAGE TECHNICAL DATA SHEET AVAILABLE

Get your copy for full details, specifications, properties, uses, solubility tables, chemical reactions, and handling and storage. CSC's Market Development team is ready to work with you in applying these versatile chemicals to your products or processes. Samples of the four basic NP's and their derivatives available on request.

THE NITROPARAFFIN DERIVATIVES

ALKATERGES
AB (2-Amino-1-butanol)
AEPD (2-Amino-2-ethyl-1, 3-propanediol)
AMPD (2-Amino-2-methyl-1, 3-propanediol)
AMP (2-Amino-2-methyl-1-propanol)
NB (2-Nitro-1-butanol)
NEPD (2-Nitro-2-ethyl-1, 3-propanediol)
NMPD (2-Nitro-2-methyl-1, 3-propanediol)
NMP (2-Nitro-2-methyl-1-propanol)
TRIS AMINO (Tris [hydroxymethyl] aminomethane)
TRIS NITRO (Tris [hydroxymethyl] nitromethane)
HAS (Hydroxylammonium Acid Sulfate)
HC (Hydroxylammonium Chloride)
HS (Hydroxylammonium Sulfate)

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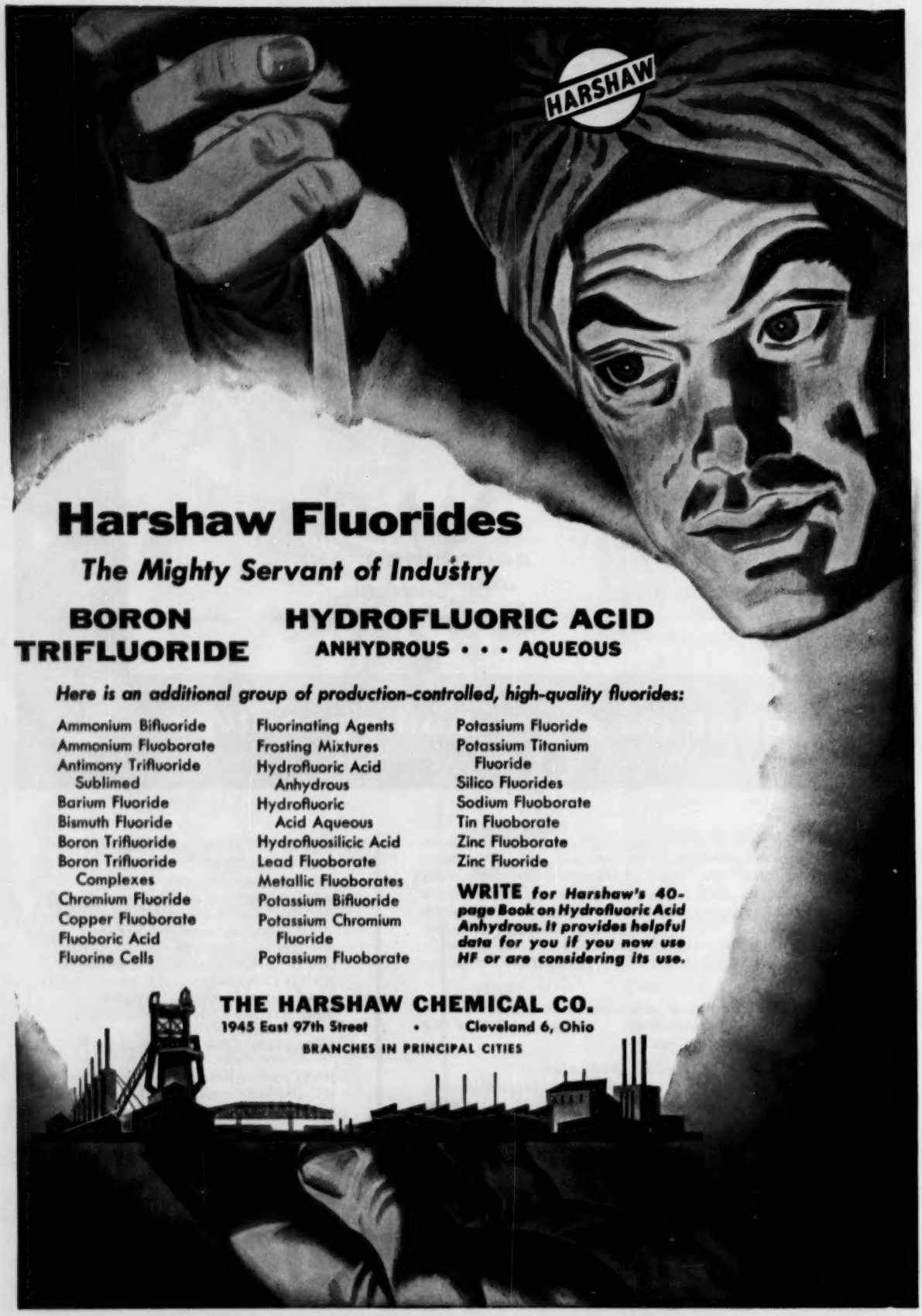

Harshaw Fluorides

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BORON TRIFLUORIDE

HYDROFLUORIC ACID
ANHYDROUS • • • AQUEOUS

Here is an additional group of production-controlled, high-quality fluorides:

- Ammonium Bifluoride
- Ammonium Fluoborate
- Antimony Trifluoride Sublimed
- Barium Fluoride
- Bismuth Fluoride
- Boron Trifluoride
- Boron Trifluoride Complexes
- Chromium Fluoride
- Copper Fluoborate
- Fluoboric Acid
- Fluorine Cells
- Fluorinating Agents
- Frosting Mixtures
- Hydrofluoric Acid Anhydrous
- Hydrofluoric Acid Aqueous
- Hydrofluosilicic Acid
- Lead Fluoborate
- Metallic Fluoborates
- Potassium Bifluoride
- Potassium Chromium Fluoride
- Potassium Fluoborate
- Potassium Fluoride
- Potassium Titanium Fluoride
- Silico Fluorides
- Sodium Fluoborate
- Tin Fluoborate
- Zinc Fluoborate
- Zinc Fluoride

WRITE ***for Harshaw's 40-page Book on Hydrofluoric Acid Anhydrous. It provides helpful data for you if you now use HF or are considering its use.***

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For high purity pipeline acetylene C_2H_2

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NATIONAL CARBIDE

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- The initial high purity of *carbide* acetylene makes purification to *your* exacting standards simple and inexpensive.
- National Carbide's policy is liberal on load factor.
- Good level construction land at the site.
- Many other basic chemicals are available from neighboring manufacturer-suppliers.
- Natural gas, plentiful water supply and TVA electric power.
- Illinois Central R.R. and navigable Tennessee River. Near geographical center of the U.S. Favorable rates to all major markets.
- Modern housing and school facilities. Industry-labor relations record is excellent.

A complete up-to-date report on the facilities and advantages of Calvert City is now available. Write National Carbide for a copy of "*Industrial Resources, Calvert City, Kentucky.*" Prepared by the Joint Civic Industrial Committee of Calvert City, and the Agricultural and Industrial Development Board of Kentucky.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

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National Carbide Company

General Offices: 60 East 42nd Street, New York 17, New York

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NATIONAL CARBIDE COMPANY is a division of **AIR REDUCTION COMPANY, INCORPORATED** • Principal products of other divisions include: **AIRCO** — industrial gases, welding and cutting equipment and acetylenic chemicals • **OHIO** — medical gases and hospital equipment • **PURESCO** — carbon dioxide, liquid-solid ("DRY-ICE") • **COLTON** — polyvinyl acetates, alcohols, and other synthetic resins.

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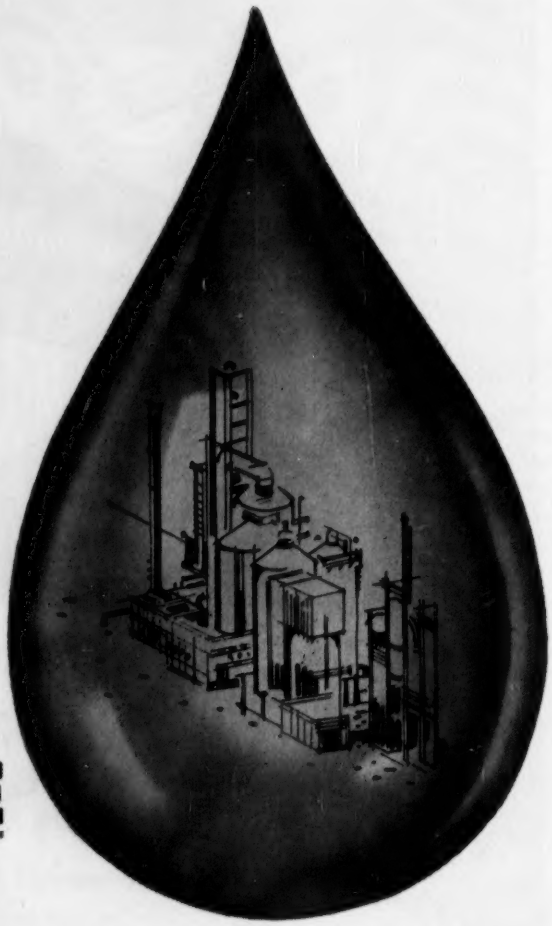
TOLUOL
XYLOL
PARAXYLENE
and
HEAVY AROMATICS

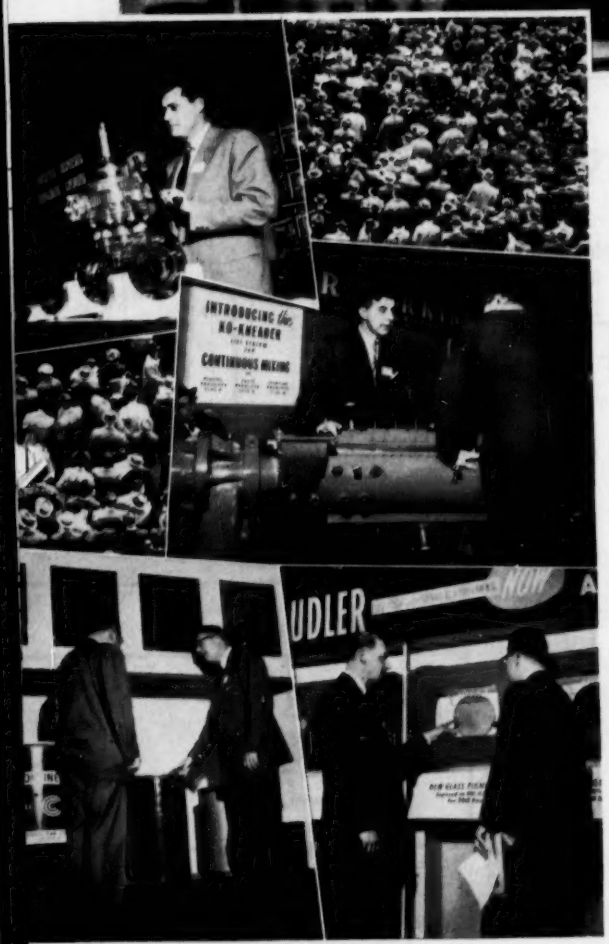


Completion of the Sinclair Aromatics Unit at Marcus Hook, Pa., Refinery means that a *new* and *dependable* source of supply of important petro-chemicals is now available to you. Designed for quantity production of high-purity Toluol, Xylol, ParaXylene and Higher boiling aromatics, this new Sinclair unit is a big step forward in meeting a basic industrial need.

If your manufacturing processes call for reliable supplies of these aromatic hydrocarbons, Sinclair is ready to serve you. For complete information call or write to . . .

SINCLAIR CHEMICALS, INC.

(Subsidiary of Sinclair Oil Corporation) 600 Fifth Avenue, New York 20, N. Y., Circle-6-3600

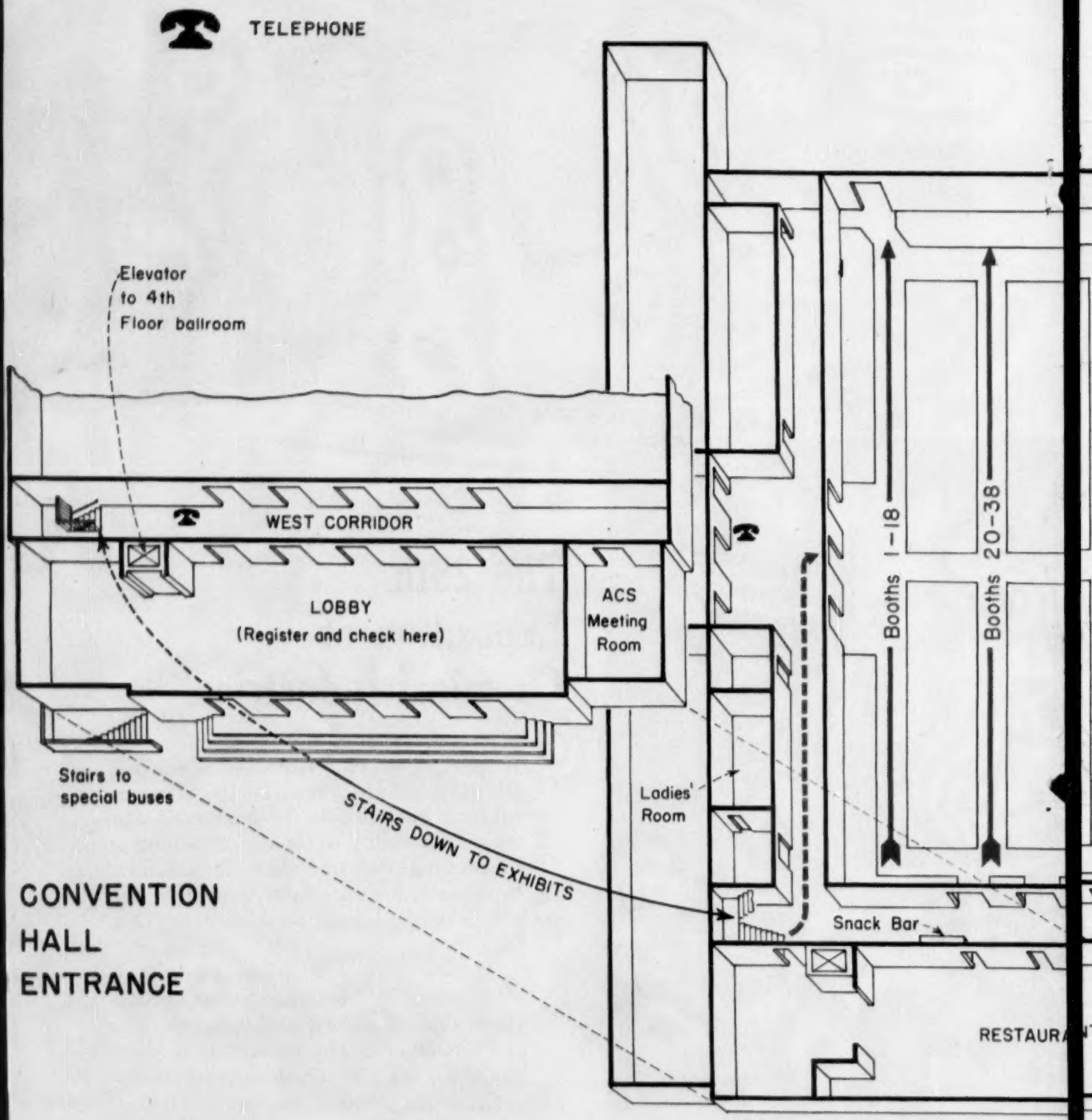


The 25th Exposition of Chemical Industries

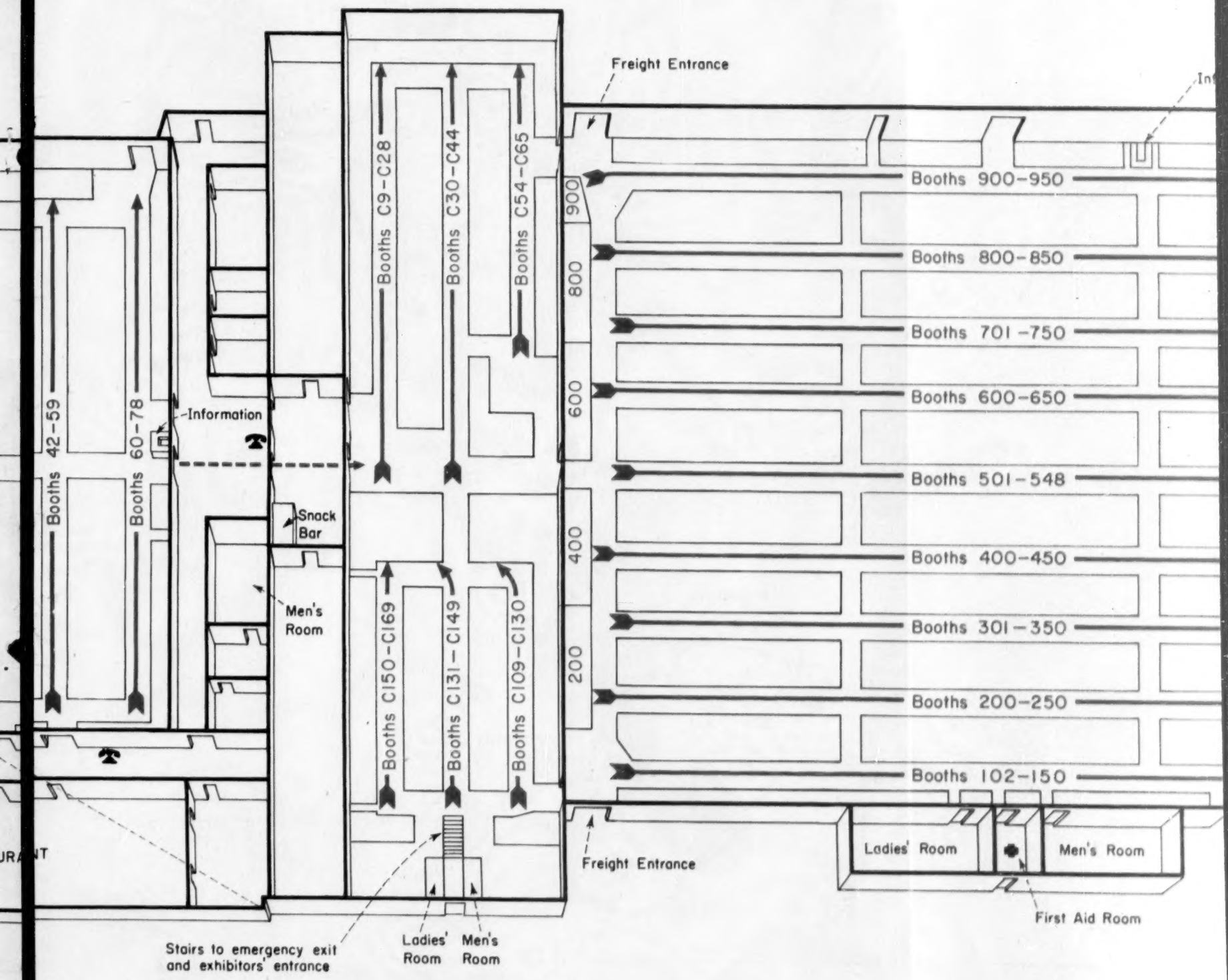
It happens every other year in the fall. It's the greatest show on earth for chemical men, particularly those charged with the responsibility of buying, designing or supervising the operation of chemical equipment. It's the Chem Show, that will run in Philadelphia next month (Dec. 5-9).

On these pages, CW presents a preview of it—some of the things you'll need to know about the show and about the city of Philadelphia. The presentation is designed for the busy chemical executive—to help him obtain a maximum yield of information and ideas with a minimum expenditure of time and effort.

Where-to-Find-It at the C



e Chem Show


Freight Entrance
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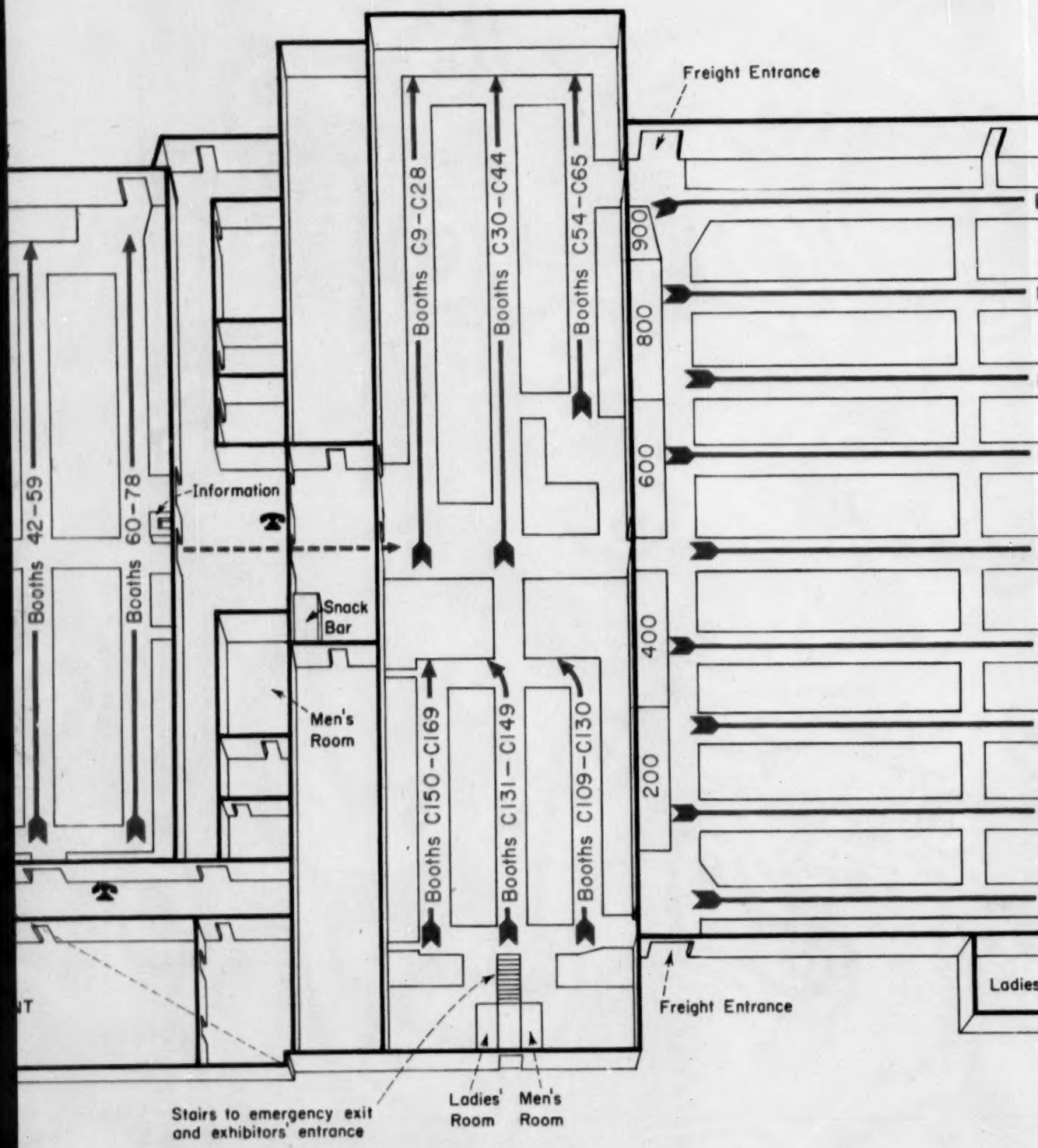
Booths C9–C28
Booths C30–C44
Booths C54–C65
Booths 42–59
Booths 60–78
Information
Snack Bar
Men's Room
Booths C150–C169
Booths C131–C149
Booths C109–C130
Freight Entrance
Ladies' Room
Men's Room
First Aid Room
Stairs to emergency exit and exhibitors' entrance
Ladies' Room
Men's Room

Chem Show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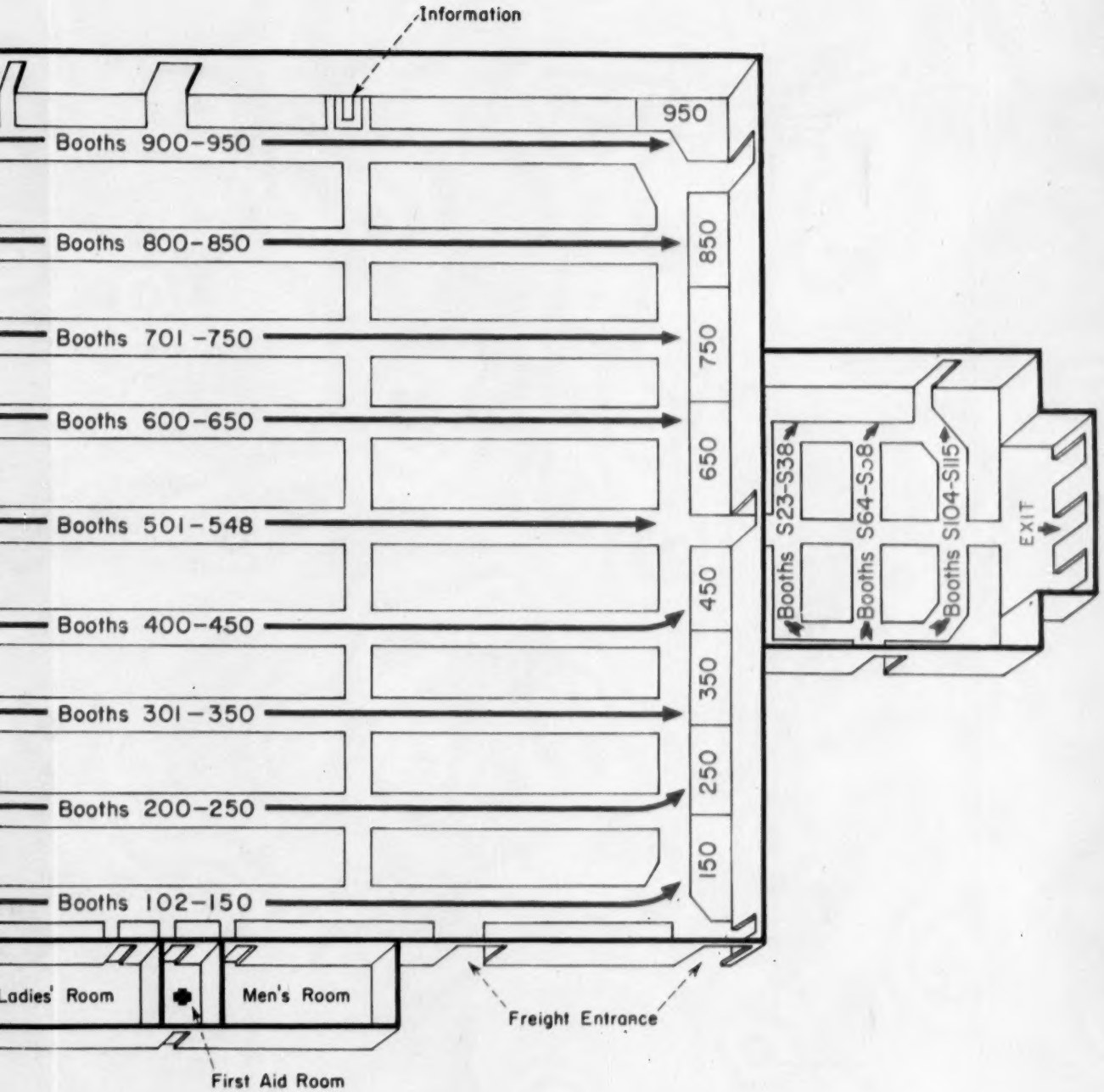
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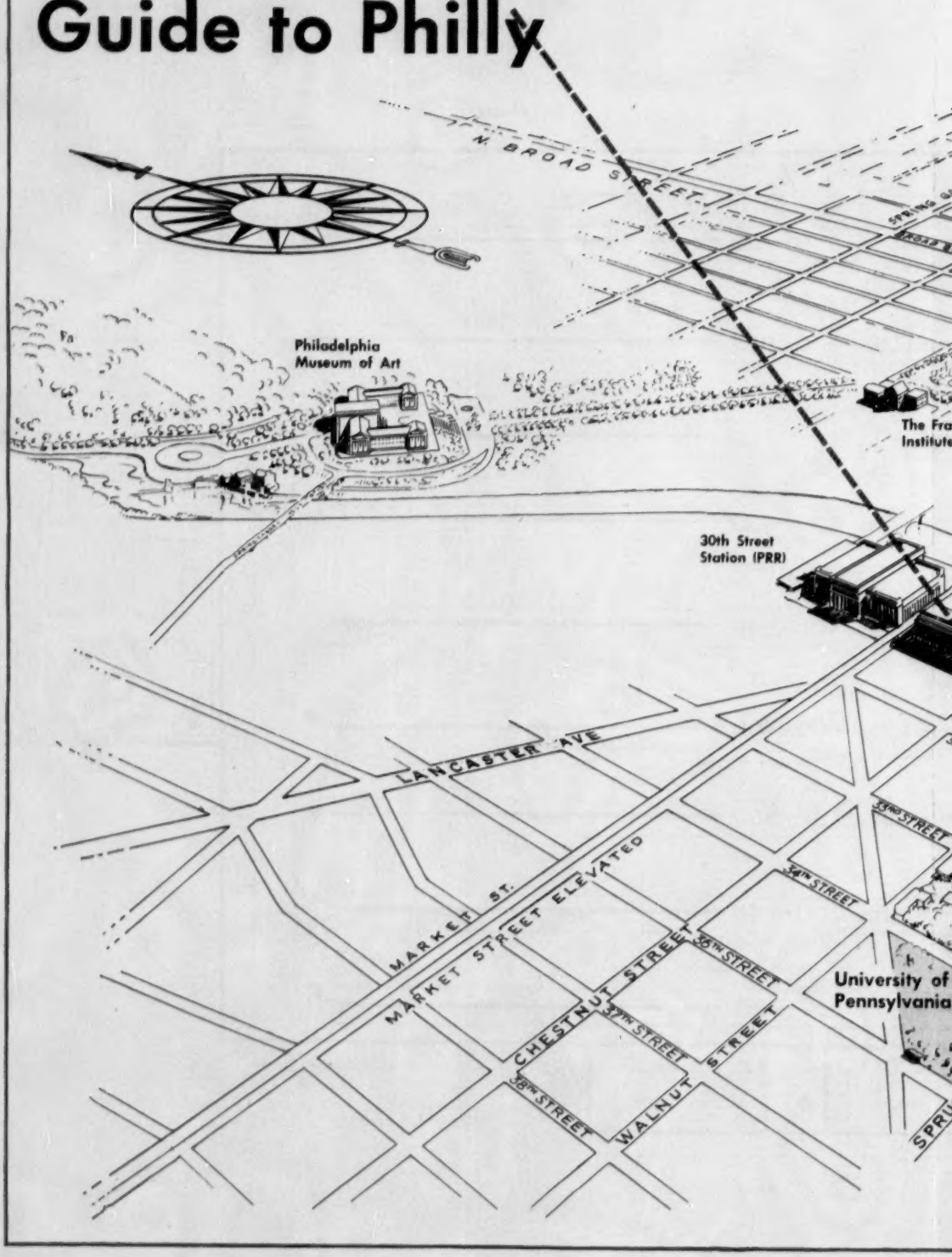
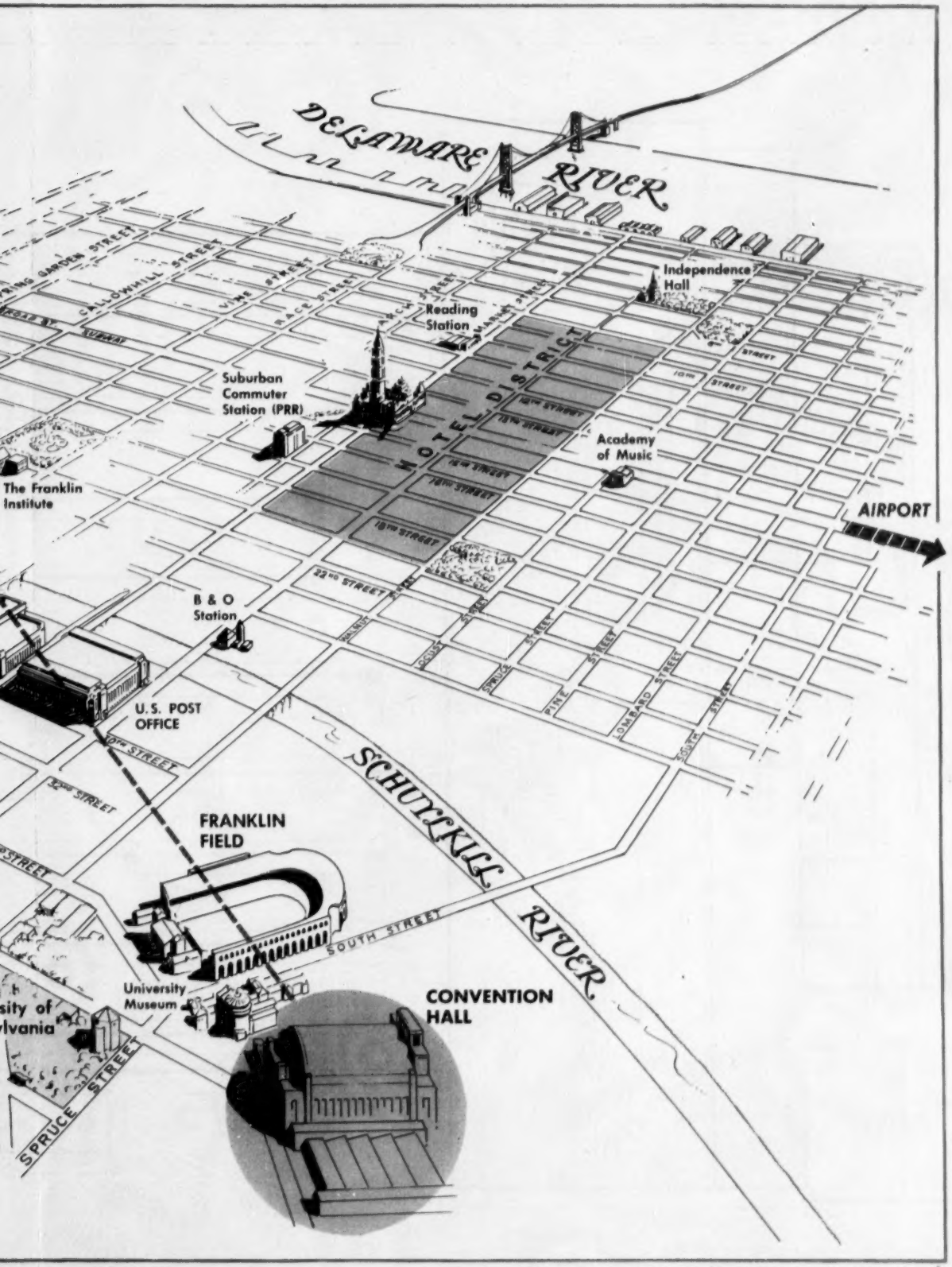
Booths S23-S38
Booths S64-S88
Booths S104-S115
EXIT
Ladies' Room
Men's Room
Freight Entrance
First Aid Room

Conventioneer's Guide to Philly





HOW TO GET IN, OUT AND AROUND PHILLY

Conventioneer's Guide to Philly

HOW TO GET INTO PHILADELPHIA FROM NEW YORK

. . . By Train

The Pennsylvania railroad runs trains from Penn Station, New York, to Philadelphia every half hour. Running time is approximately 1 hour and 40 minutes. To get to either the hotel district or Convention Hall, get off at the 30th Street Station and take a cab. (If you're in a rush to get to the hotel district, you can save time by taking the shuttle to the Suburban Commuter's Station; or get off at the North Philadelphia Station and take the subway.) If there's a crowd waiting for cabs, be sure to get a ticket stamped with a number from the machine near the entrance. And you can save time and win friends all around by sharing a cab.

You can also get to Philadelphia from New York by the Reading or the B&O. Both lines run trains from Jersey City that connect with ferries from New York. The B&O, in addition, runs buses from key spots in New York City that cross the ferry and connect with the trains directly. Service via the two lines, while not so frequent as the Pennsylvania, is excellent. Running time averages 2½ hours from New York. Both terminals are just a short cab trip from the hotel district or Convention Hall.

. . . By Plane

Five airlines (Eastern, American, National, TWA, United) run planes from New York to Philadelphia. They leave from the metropolitan airports (Newark, La Guardia or Idlewild) practically every hour. Running time is about 45 minutes.

The plane service is ideal, of course, for anyone flying into New York from a distance. Add the cab trips at both ends, however, and it's hard to beat the train time for "door-to-door."

. . . By Car

Take the New Jersey Turnpike to the Camden-Philadelphia Interchange (Exit 4). Following the signs, you'll enter Philadelphia via the Delaware River bridge (*see opposite map*) from which you can find the hotel district without any difficulty. Time getting into and out of the cities will vary with the traffic, but should average out at approximately 2½ hours.

FROM WASHINGTON

. . . By Train

Train service from Washington (and Baltimore) to Philadelphia is almost as good as that from New York to Philadelphia. The Pennsylvania trains run every hour on the half-hour. Running time is about 2½ hours. The B&O runs eight trains/day. Running time is comparable. Procedures will be same as those for arriving from New York (except, of course, going to North Philly would lose rather than save time).

. . . By Plane

Three lines (American, Eastern, National) run planes from Washington to New York. Running time is about 45 minutes. Service is good, and though fewer lines make the run, the longer distance (and more accessible airports) make plane travel slightly more attractive from Washington than from New York to Philadelphia.

. . . By Car

Proceed to New Jersey Turnpike and follow same directions as for getting to Philadelphia from New York. Driving time will vary tremendously, but you had better count on 3½ hours.

Chemists- Research Scientists- here's high quality

elemental BORON
(AMORPHOUS)

at attractive prices!

Here's NEW
20 MULE TEAM
BORON
in two grades
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20 MULE TEAM
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BORON has many unique and outstanding properties of great potential interest to you. This element has never been thoroughly researched due to non-availability of a quality product at economically attractive price levels. Now you can choose from two grades of elemental Boron—both in an amorphous form—reasonably priced in commercial quantities. Our new and improved process methods have made it possible to combine high quality Boron *and* economically realistic prices. Both grades are readily available now in experimental and pilot-plant quantities.

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MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

What to See at the Show

Early next month, Philadelphia will once again play host to the Exposition of Chemical Industries.

Here are some of the things you'll want to see:

In Philadelphia's Convention Hall, workmen will soon start to assemble some 1 million lbs. of chemical equipment and material. When put together, it will be put on display for some 31,000 chemical executives, engineers and chemists who will walk approximately 5 miles each in viewing it.*

But it's more than "just another show." The Silver Anniversary Exposition is a capsule view of the chemical industries' progress. Among the 500-odd exhibits, you'll find everything from the latest modifications of standard equipment items to new complete systems for the field of nuclear science. And whatever your special interest may be, chances are you'll have no trouble finding someone who knows the answers in your own language.

Though none of the exhibitors employs cane-wielding barkers to pull in passers-by, they've a good many other eye-catching, interest-holding devices to attract your attention. The Pfaudler Co., for example, will invite visitors to swing a sledge hammer at a carnival-type strength tester in the vicinity of its 28-ft.-high glassed-steel column display. The test will demonstrate both the sledge swinger's ability and the toughness of Pfaudler's glassed-steel.

Other attention-getters will make free use of transparent plastic construction to give viewers a glimpse of what goes on inside of processing equipment. Neumann & Weaver, Inc., will demonstrate its new Model RKM centrifugal mixer by showing it at work in a Plexiglas tank. The F. R. Gross Co., on the other hand, actually substitutes glass for metal to show flow of liquid through the spiral channel on the outer surface of its cooling roll.

Warren Steam Pump Co. Inc. will demonstrate the advantages of screw pumps for handling high-viscosity fluids with a plastic pump moving 200,000-SSU viscosity oil at pressures

* The million pounds is the estimated tonnage for the equipment and materials used in the 1953 Chem Show; 26,000 people registered 31,000 times to see it; W. T. Read (who administers the college student attendance phase of the exposition) donned a pedometer and clocked 5 miles for a "tour" in 1953.

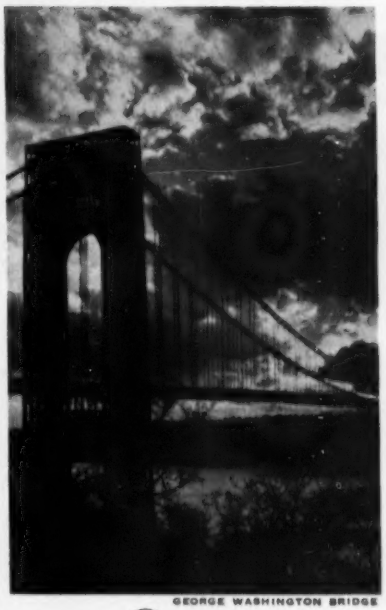
When Should You See the Chem Show?

There is, of course, no answer to such a question. However, here are a few hints that you might find helpful:

• The attendance in shows in the past has always tended to rise toward the end of the week. At the same time, the men manning the booths tire from the long grind and repetitive questions. By going early in the week, you'll hit the show when it's not so crowded and when the exhibitors will have more vitality.

• If you want to stay in Philadelphia overnight and don't plan to go to the Chemical Engineering Achievement Award dinner, remember that this event customarily ties up large blocks of hotel rooms for one night (Wednesday). If you haven't made your reservations yet, you'll have a better chance of getting a good room other nights during the week.

• If you plan to "do" the show in one day, remember that it's open only Monday and Thursday evenings this year. And it's not open on Saturday.



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Send for our new catalog "Fatty Acids In Modern Industry".

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Titre	134.6°F. min.	134.6°—141.8°F.
Color 5¼" Lovibond Red	0.4 — 2	5 max.
Color 5¼" Lovibond Yellow	2 — 15	30 max.
Unsaponifiable	0.75% max.	—
Saponification Value	202 — 204	193 — 196
Acid Value	201 — 203	10 max.
Iodine Value (WIJS)	3 max.	3 max.

a. gross & COMPANY

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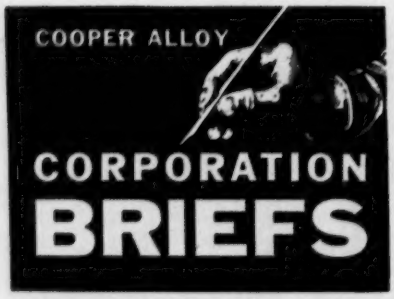

• Edited by GEORGE BLACK

PRODUCTION INCREASED

Installation of a new Goss & Deleeuw Chucking machine at our Stainless Engineering and Machine Works Division, will speed delivery of valves and fittings. The Goss machine has seven rotating spindles, four of which are used for holding end working cutting tools and three for threading applications. A 34% reduction in the machining time of stainless steel 90° ells and tees has already been demonstrated.

PUMPING CUTTING FLUIDS

A new bulletin describing the handling of cutting fluids used for machining stainless steel has been announced by Vanton Pump & Equipment Corp. Reprinted from an article appearing in Machinery Magazine, the bulletin gives full technical data and description of the pumping problem and its solution. The pump involved has a Bakelite body block and Hycar flexible liner. Ask for Bulletin VP17.

CASTING PUMP PARTS

The story behind the redesign and unique foundry techniques involved in substituting stainless steel end plates for aluminum, cutting the weight of the stainless housing and reducing machining time from 14 hours to 2 is told in Advanced Know-How # 2. This second in the series of case histories being prepared by our Foundry Products Division, shows how the use of the shellcast® and shellcores made possible a better product (the Vanton pump) for less money. Ask for AKH #2.

CHEMICAL SHOW—PHILADELPHIA

Three hundred and sixty square feet of exhibit space referred to as Booth 602 will be devoted to telling how Advanced Know-How makes the difference in corrosion resistant Castings, Valves, Fittings and Pumps. There will be plenty of products on display, plus working and cut-a-way models. Our key people will be on hand to greet you and assist in any way possible. We hope you'll stop by.

COOPER ALLOY
CORPORATION • HILLSIDE, N.J.

to 300 psi., suction lifts to 20 in. of mercury. As an added attraction, visitors will be able to vary pumping conditions by adjusting valves.

Equipment Firsts: Several pieces of equipment will be making their public debut at the Chem Show. The Girdler Co.'s Votator Division, for instance, will display for the first time the continuous mixer-cooling equipment used for the production of polyurethane and vinyl foams.

Franklin P. Miller & Son, Inc., will unveil its Supreme Model 1702 wax chipper, a new device for reducing standard slabs of waxes or rosin-like materials to fine chips.

Featured in the exhibit of Baker Perkins Inc. will be the newly developed B-P (List System) Ko-Kneader continuous mixing-kneading machine for use with dry, semiplastic and plastic masses.

Barnebey-Cheney Co. will show, for the first time, its new line of industrial adsorber; super-activated grades of Black Magic activated charcoal; and a disposable, low-air-resistance, air purification filter.

The Mechanical Research Division of Quaker Oats will exhibit its Coronatron electrostatic separator, and new apparatus for continuous indication and control of moisture in flowing materials.

Emphasis on Instruments: The chemical industry's growing dependence on automatic instrumentation and control engineering will be evident from the large number and variety of instrument exhibits. Bailey Meter Co. will introduce three new basic control devices: a dc. receiver-recorder that continuously records any four variables from dc. pickups on one circular chart; the Bailey running time recorder; and a new square-root transmitter.

Beckman Division of Beckman Instruments will display a dispersive infrared analyzer (Model 176)—the first to use the Wright-Herscher optical system. Also on display will be Beckman's direct-reading flame photometer, and a new leak detector which will use a mass-spectrometer principle.

A gas chromatography principle is utilized both in Perkin-Elmer's new gas and/or liquid analyzer and in Podbielniak's Thermocon that records thermal conductivity and boiling point of vapor distillates.

Fischer & Porter will exhibit 12 new instruments and instrument systems; featured will be its newest analog-to-digital converter—the Type P Digi-Coder, and a new ultrasonic flowmeter capable of measuring both mass and volume flow. (Other mass flow-meters can be seen at Control Engineering Corp.'s and Potter Aeronautical Co.'s booths.)

Taylor Instrument Companies unveil a first: the Transet Scanning and Logging Control system, which integrates process control with data collection and logging.

Foxboro Co. will show its Model 14A pneumatic integrator—a unique device that operates on a novel centrifugal principle, instead of square-root cams, for the continuous integration of industrial process flows.

Ferranti-Electric Corp. will have on display its new rotational viscometer, which is said to be useful over a wide range of shearing stress. In addition, it will show a portable viscometer.

For metering applications, Milton Roy will be showing off its recently unveiled Minus Delta P., downhill metering pump. And its affiliate, Chempump, will show the first two-stage canned pump.

The Industrial Division of Minne-

It's a Social Week, Too

The Chemical Exposition isn't the only big chemical event in Philadelphia the week of Dec. 5-9, of course. Two dinners that you may want to make your plans around:

• The Benjamin Franklin dinner (Tues., Dec. 6) sponsored by the Philadelphia Section of the American Chemical Society. Tickets ($8.50) include reception and cocktails (6:30 p.m.) and dinner (7:15 p.m.). Speaker will be Kevin McCann, special assistant to President Eisenhower.

• The Chemical Engineering Achievement Award dinner (Wed., Dec. 7) at which Dow Corning will receive *Chemical Engineering's* coveted award for its silicones *(CW, Sept. 24, '55, p. 113)*. Tickets ($25) are by reservation only. Speaker will be Manufacturing Chemists' Assn.'s president, General John Hull.

A chemical property of molybdenum helps make the Ford Thunderbird's Fiesta Red finish. Molybdenum orange brings warmth, brilliance and long service to car owners everywhere.

Moly modifies crystal structures

Lead molybdate in small quantities changes the crystal structure of lead chromate to a new form with unusual properties. The mixed crystal is known as molybdenum orange. This brilliant pigment has a deep reddish orange hue, great hiding power, and high tinting strength.

Can you improve the crystal structures of your materials by incorporating a molybdate or one of the other molybdenum salts? Write Department 28 for our bulletin, "Molybdenum Chemicals."

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- polymerizes
- precipitates
- reduces
- solubilizes

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Same outwardly appearance, same good general properties offered by many other plasticizers . . . but the curtain (or any vinyl product) containing Adipol XX plasticizer for low temperature flexibility is longer lasting.

Adipol XX is a primary plasticizer for most resins. It imparts good low temperature properties and more important . . . permanence. The properties imparted by Adipol XX stay with the plastic on aging.

In laboratory tests Adipol XX shows a Clash & Berg low temperature flexibility of —59 at 49 parts per hundred resin. A good indication of its permanence is shown by a carbon volatility loss of only 1.9 which is very good compared with other commercial plasticizers.

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DEPT. 36

☐ Send technical literature.
☐ Send samples of ADIPOL* XX

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apolis-Honeywell Regulator Co. will be exhibiting its ElectroniK quarter-second strip chart recorder—rated as having the fastest pen speed of all conventional electronic potentiometers with full, 11-in. chart. Also, it will have Tel-O-Set pressure and temperature transmitters as well as Tel-O-Set new quick-connect line of miniature pneumatic instruments.

Leeds & Northrup will show packaged control systems actually controlling simulated nuclear operations.

In the Minority: Though they'll be outnumbered by equipment exhibits, chemical products and raw materials will be represented by a variety of displays. Quaker Oats Co.'s Chemicals Dept. will present, for the first time in the East, the QO Furan chemicals for resin, synthetic rubber, petroleum, organic chemical and other applications.

Emery Industries will show off several new chemicals, including a new plasticizer for synthetic rubber and a new diester base for lubricants and greases. And Natural Rosin Oil Products (Savannah, Ga.) will have a new pelletized rosin at its booth.

Chemical products will also be seen in some new and unusual roles as materials of construction. For example, the use of epoxy resin (Durcon) in Duriron Co.'s pumps, fans, valves, etc., marks the first nonmetallic products in the company's 43-year history.

Luzerne Rubber Co. will be showing a variety of custom-molded polystyrene, polyethylene and rubber-resin compounds.

For those interested in the application of corrosion-resistant plastic coatings, American Agile Corp. offers a first look at an entirely new fluidized coating process. Said to be a new concept in coating techniques, it involves the use of a powder fluidizer—a compact unit that maintains the plastic powder in a turbulent dense-fluid state. Targets to be coated with polyethylene, polyfluorocarbon, nylon or other plastics are first heated to predetermined temperature. Then, they're immersed in the fluidized powder, where a uniform coating up to 3/16 in. thick is deposited on the surface. A short curing period completes the job of putting firmly adherent corrosion-proof cladding on such irregular shapes as propellers, mixing blades, fans.

National Carbon Co. will display a new line of Karbate impregnated carbon pipes and fittings. The items are armored with glass fabric to prevent "gross leakage" in case of accidental breakage. It will also have a new Karbate Saunders-type valve with a diaphragm of Teflon, neoprene or rubber.

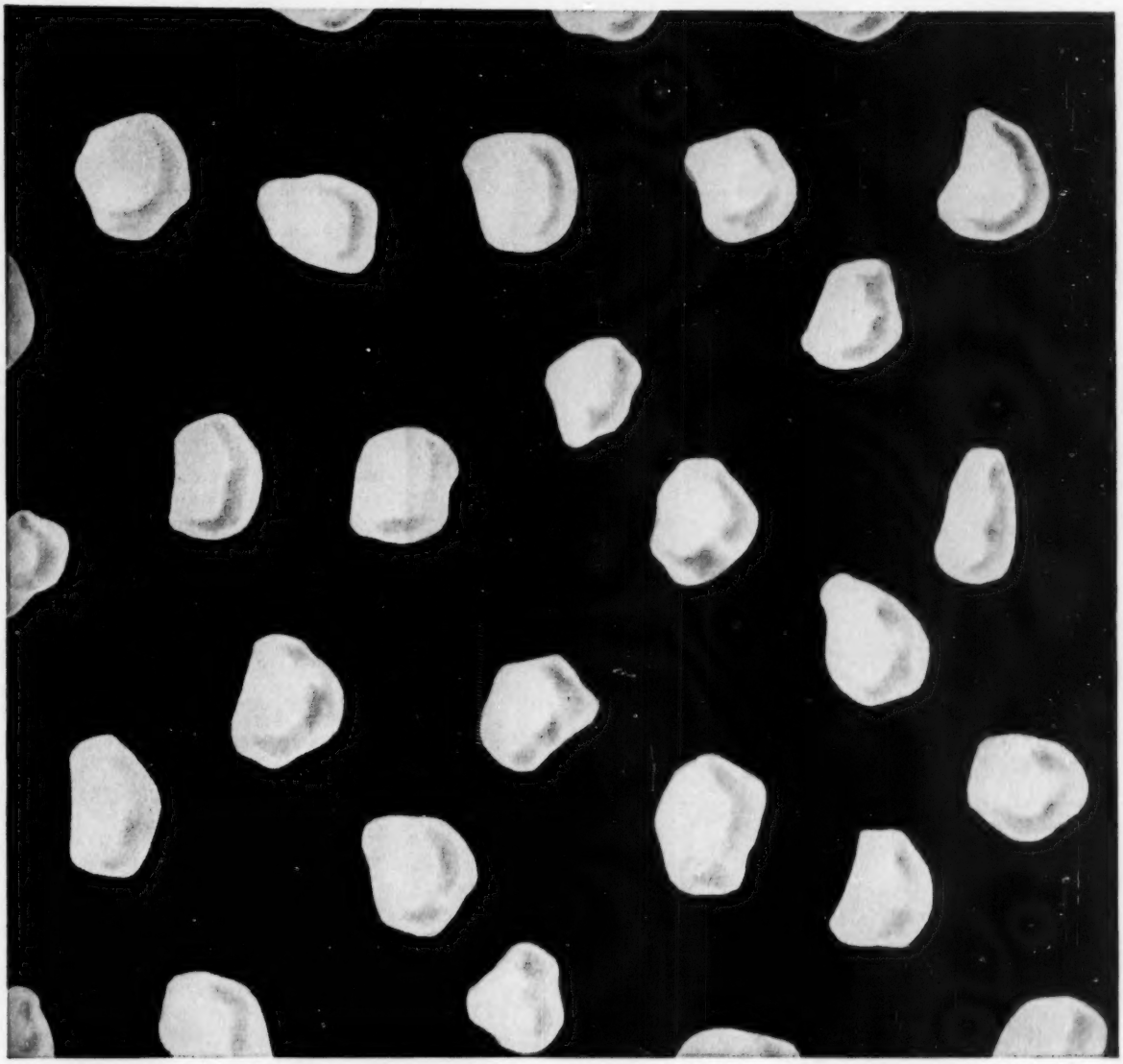
Owens-Corning Fiberglas will show off its Kaylo 20, the new high-temperature insulator. In fact, the firm promises it will exhibit an insulation material that will accommodate any temperature ranging from absolute zero to 2000 F.

The so-called wonder metal, titanium, will also be shown at the exposition. Rem-Cru Titanium will have at its booth parts of a sodium hypochlorite filter press used at Pennsalt's Whitemarsh Laboratories in Philadelphia. (The titanium parts of the press lasted seven months without signs of wear. Comparable ones made of stainless steel lasted only a few weeks.) Rem-Cru will also show titanium-tipped anodizing racks constructed by Omega, Inc., as well as titanium television tubes made by General Electric. And Pfaudler will emphasize its interest in titanium fabrication by displaying a titanium reactor.

Pick a Plant: As in 1953's exposition, you'll notice an increasing emphasis on complete plants put on display by engineering-construction firms. Chemical and Industrial Corp., for instance, will have a model of its nitric acid plant and a scale-model of a Stengel process ammonium nitrate plant.

M. W. Kellogg's booth will feature the pilot plant that developed the process for the new synthetic gasoline plant that has just started up in South Africa. F. Ward Harmon Assn. will plug a do-it-yourself scale-model kit including miniature vessels, materials for heat exchangers, piping valves and pumps.

All told, there will be over 500 exhibitors with their wares on display. They'll have instruments and indicators, mixers, blenders, digesters, extractors and evaporators, filling machines and filter cloths, equipment for process industry jobs fabricated of every conceivable material of construction. It should be a great, advance view of chemical technology on parade.



How to control particle distribution

In paint and plastics manufacturing—in emulsion polymerization—Du Pont surface active agents are proving to be ideal emulsifiers for these systems. These specialized agents help to increase rate of polymerization and assist in maintaining uniformity of size and distribution of the particles. They do not discolor the emulsion and give *reproducible* results.

There are over 50 Du Pont surface active agents available, each carefully controlled during manufacture to assure uniformity. Among them are anionics, cationics, nonionics and some amphoterics. These specialty chemicals are used today in such diverse operations as electroplating, oil drilling and textile processing.

You may well find the surface active agent you need in the Du Pont line if you're interested in building foam, increasing wetting—even in acid solutions, improving emulsification or making specialty products. We'll be glad to discuss your problem with you.

WRITE US ON COMPANY LETTERHEAD and give us the details of the application you have in mind. We'll do our best to suggest the surface active agent that can help you. Address: E.I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Wilmington 98, Delaware.

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DU PONT SURFACE ACTIVE AGENTS

STEVENS AND BRUCE: Quietly, behind the scenes, they're . . .

Putting the Show Together

When you walk into Convention Hall next fortnight and take your first glimpse of the 25th Chem Show, you'll be looking at a well-lighted spectacle —a finished picture that's maybe a bit busy and confused, but one that's distinctly polished and professional. This week, the picture is in pieces. Only the busy and confused aspects are visible. The polish and professional touches are mere gleams in the eyes of Exposition Manager Earl Stevens* and his associate manager, Charles Bruce.

Upon their shoulders falls the large order of lining up the exhibitors and coordinating all the various activities. But this is an old story for both: Stevens has been helping to put the giant jigsaw together since 1933, and Bruce since 1942.

It was the last show (1953) that caused the problems, for that was the first show held in Philadelphia. This year, things are running a lot smoother.

And, as a result of the things learned at the last show, things will be quite different this time.

Probably the biggest change in the show is the time. In New York, it was kept open for six days (Monday through Saturday), and open at night during the week until 10 o'clock. The same practice was carried over to Philadelphia last time. "But," says Stevens, "Philadelphia just isn't a night town in the sense that New York is." As a result, night attendance fell off, and Stevens decided to keep it open only two nights (Monday and Thursday) and to close it after Friday.

Mixed Reaction: In general, says Stevens, the reaction to the move from New York to Philadelphia was mixed. Because of the larger exhibition area of Convention Hall, the exhibition was able to accommodate new exhibitors. Similarly, many exhibitors were able to get more space than they could have had in New York. This made these two categories happy. On the other hand, some exhibitors didn't like the idea at all—in fact, some didn't go to Philadelphia.

And, besides the fall-off at night, total attendance fell off. This, too, was a natural result. Stevens reasons like this: A busy man in New York might stop in at Grand Central Palace, take a quick tour of the exposition and be back at his desk—losing only a few hours of working time. To go to Philadelphia, he'd have to figure on spending practically a whole day.

By the same token, this has its bright side. Stevens reports that a close check of the exhibitors shows that while the total was off somewhat, the quality was up slightly. That is, the men who toured the exhibit were, in general, better potential customers for chemical equipment and materials. That is to be expected, too. For, as he points out, anyone who would travel to Philadelphia just to see the show is more likely to be interested in doing business than the fellow who simply drops in on his lunch hour.

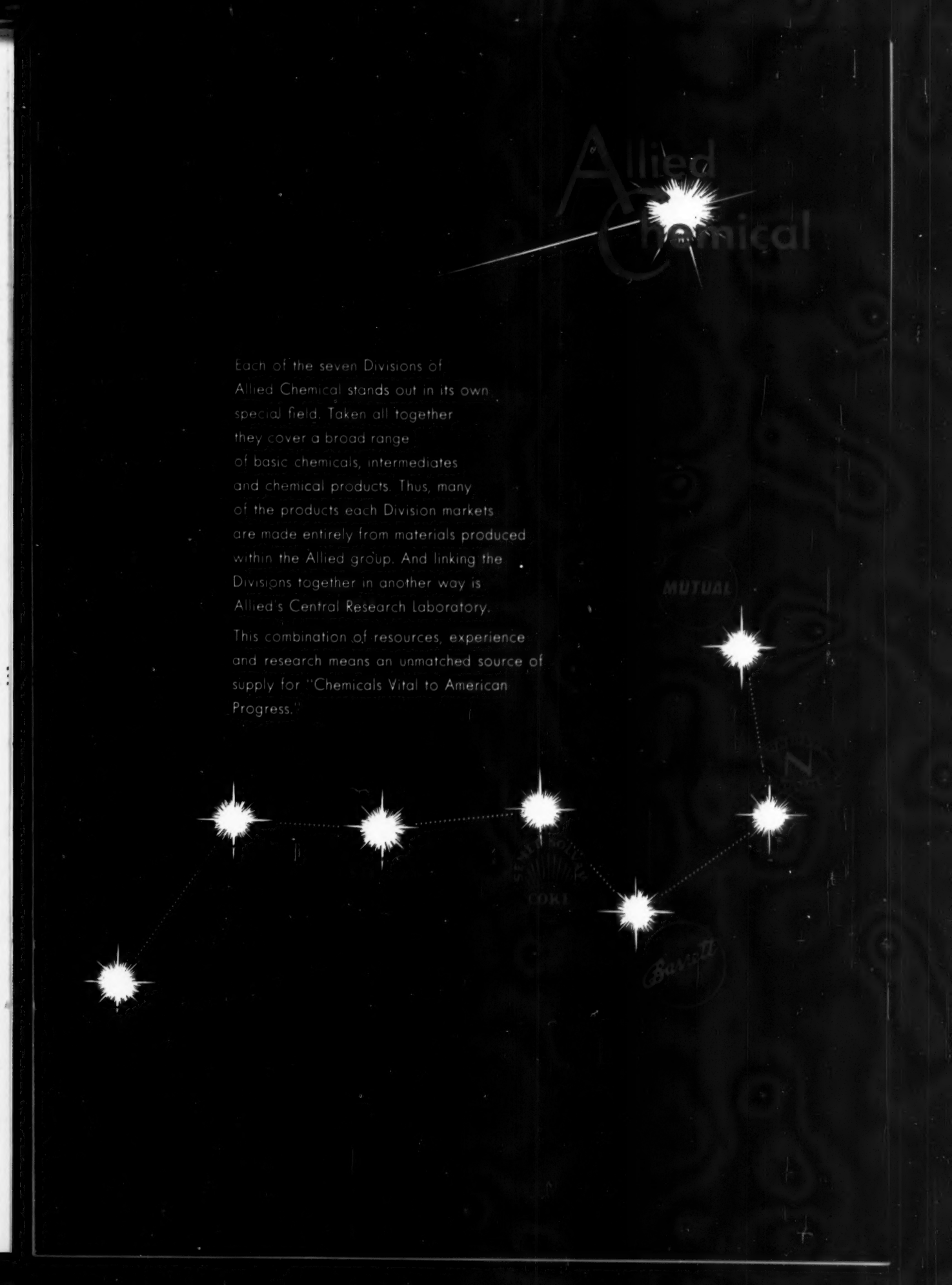
Service Plus: The move to Philadelphia last time caused other changes, too: For instance, Philadelphia doesn't have the pulling power for out-of-town visitors that New York does. And whereas New York City can absorb an extra 30,000 visitors without any measurable effect, a crowd of that size is apt to put a strain on the service facilities in Philadelphia. Visitors last time, for example, found reason to complain about the shortage of hotel rooms, slow service in restaurants and long waits for taxi cabs.

More than compensating for that, however, is the extra hospitality of the citizens. The Housing Bureau of the Philadelphia Convention and Visitor's Bureau, in particular, did a praiseworthy job in finding hotel accommodations. And it will put forth the same effort this year, setting up a station alongside the registration desk. (If it can't get you a first-rate room in Philadelphia, it will make accommodations for you in Wilmington or Trenton.)

And to expedite transportation, a special bus service will run from the hotel district to Convention Hall. Buses will start a half hour before the show and run at regular intervals throughout the day.

In any case, though the '53 Philadelphia exposition was counted a success, the one this year may be the last one held in that city. For in 1957 the exposition will move back to New York City—to the new coliseum. And that may prove to be the happy hunting grounds for the exhibitor: an exposition area approaching the spaciousness of Convention Hall with the accessibility of New York.

* Formerly associate manager of the exposition, Stevens took over after the untimely death of Charles Roth last year from injuries received in an automobile accident.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Allied Chemical stands out in its own
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For over a century the Barrett name has been the first in roofing. Today Barrett's trademark covers a host of other products—from Naphthalene to Niacin to Nylon Molding Resins of the growing PLASKON line.

GENERAL CHEMICAL DIVISION

Famous as a dependable source of supply for sulfuric acid and other heavy chemicals, as well as its BAKER & ADAMSON line of laboratory reagents, General has hit a new stride with GENETRONS for aerosols and refrigeration.

MUTUAL CHEMICAL DIVISION

Principal American producer of chromium chemicals, Mutual is constantly broadening the fields of application for these versatile products. Mutual has a number of new chromium compounds under evalution now by industry.

NATIONAL ANILINE DIVISION

Long a leader in dyes, certified food colors and coal-tar chemicals, now introducing *caprolan*, the deep-dye nylon, and entering the fast-developing field of organic isocyanates—source of polyurethan products for improved synthetic rubbers, plastics, adhesives and surface coatings.

NITROGEN DIVISION

World's foremost producer of fixed nitrogen in its many forms, offering a wide line of ARCADIAN fertilizers and feed mixtures for profitable farming. Last year this Division added ethylene oxide-glycols to its line and, more recently, ethanolamines.

SEMET-SOLVAY DIVISION

First in merchant coke production and long established as a builder of Wilputte by-product coke ovens, Semet-Solvay is winning new customers with its A-C POLYETHYLENE for use in coatings for food cartons and paper, in printing inks, waxes and polishes.

SOLVAY PROCESS DIVISION

Long-established leader in alkali production, Solvay has found new markets with its line of chlorinated methane products, and will soon be offering a new process hydrogen peroxide.

KALEIDOSCOPE

OF NEW AND BETTER PRODUCTS FROM ALLIED CHEMICAL

There's a bright array of new and better products in the market place today and different as their uses and users are, they have this in common: they are derived from chemicals produced by the seven great Divisions of Allied Chemical.

These seven Divisions are ALLIED not only in name but in resources and research. Each Division is a pioneer in its field of chemical operations; all together they form the vast productive capacity and exceptional diversification that make Allied Chemical the nation's leading manufacturer of chemicals.

Even from the quick run-down given here of Allied Division activities, it's clear that Allied Chemical is many-faceted—both diversified and strongly integrated. All told these seven Divisions turn out more than 3,000 products. For over 35 years, Allied's list of "Chemicals Vital to American Progress" has been growing longer—and the products have kept growing better.

Allied Chemical & Dye Corporation

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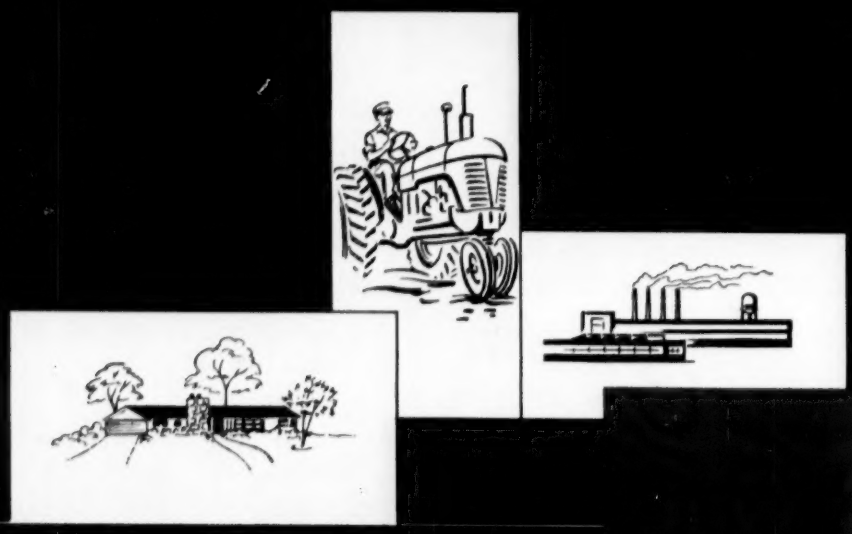

BARRETT DIVISION

Coal-Tar Chemicals, Resins, Plastics and Plasticizers, Roofing, Insulating Board and other Building Products, Bituminous Road materials, Pipeline Enamels, Wood Preservatives, Industrial Pitches.

GENERAL CHEMICAL DIVISION

Sulfuric and Other Commercial Acids, Alums, Phosphates, Sodium Compounds, "Genetrons" and other Fluorine Compounds, Reagent and Laboratory Chemicals, Insecticides and Fungicides.

MUTUAL CHEMICAL DIVISION

Sodium Bichromate, Sodium Chromate, Potassium Bichromate, Chromic Acid, "Koreon," and other chromium chemicals.

NATIONAL ANILINE DIVISION

Dyestuffs and Certified Food Colors, Industrial Intermediates, Synthetic Detergents, Pharmaceuticals, *caprolan* Nylon Fiber.

NITROGEN DIVISION

Anhydrous Ammonia, Nitrogen Solutions, Urea, Fertilizer Materials, Methanol, Formaldehyde.

SEMET-SOLVAY DIVISION

Coke and By-Products, Coal, Gas Producing Apparatus, Wilputte Coke Ovens, and A-C Polyethylenes.

SOLVAY PROCESS DIVISION

Alkalis, Chlorine, Calcium Chloride, Ammonium and Potassium Compounds, Alkali Cleansers, Chlorinated Hydrocarbons.

INTERNATIONAL DIVISION

LET ALLIED RESEARCH HELP YOU

Each Allied Division conducts its own research in its own laboratories. In addition, all Divisions benefit from the research activities of Allied's Central Research Laboratory at Morristown, New Jersey. All told, Allied maintains 12 laboratories staffed by more than 1,600 people.

These extensive research facilities are at the disposal of industry in the development of new and better products. Allied welcomes the opportunity to put them to work for you.

See floor plan on p. 66

Lists of Exhibitors

25TH EXPOSITION OF CHEMICAL INDUSTRIES

Convention Hall—Philadelphia

December 5-9, 1955

Name of Exhibitor — *Booth No.*

A

Ace Glass Inc., Vineland, N. J. 710
Ackerman, Harold P., 320 McClatchy Bldg., Upper Darby, Pa. 824
Adams Co., R. P., 225 East Park Dr., Buffalo 17, N. Y. 410
Aerco Corp., Northvale, N. J. 824
Aetna Scientific Co., Second & Spring, Everett, Mass. 221
Airetool Mfg. Co., The, Springfield, Ohio S-74
Alberene Stone Corp. of Virginia, 419 Fouth Ave., New York 16, N. Y. 533
Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa. 28
Allen-Sherman-Hoff Pump Co., The, 259 East Lancaster Ave., Wynnewood, Pa. C-119-C-121
Allis-Chalmers Mfg. Co., General Machinery Div., West Allis Work, Milwaukee, Wisc. 934
Allis Co., The Louis, Milwaukee 7, Wis. 931
Alloy Steel Products Co., Linden, N. J. 35
Alpha Plastics Inc., 14 Northfield Ave., West Orange, N. J. S-108
Alsop Engineering Corp., Milldale, Conn. 110
Aluminum Co. of America, Pittsburgh 19, Pa. 233-235
American Agile Corp., 5461 Dunham Road, Maple Heights, Ohio 52
American Air Filter Co., Louisville 8, Ky. 150 & 250
American Chemical Society, 1155 Sixteenth St., N. W., Washington 6, D. C. 1
American Chemical Society News Service, 2 Park Ave., New York 16, N. Y. 1
American Gas Furnace Co., Elizabeth B, N. J. 638
American Institute of Chemical Engineers, 25 West 45th St., New York 36, N. Y. 828
American Instrument Co., 8030-8050 Georgia Ave., Silver Spring, Md. 736
American Machine and Metals, Inc., Tolhurst Centrifugals and Niagara Filters Divisions, East Moline, Ill. 802-806
American Plant Equipment Co., 701 Spring Street, Elizabeth 4, N. J. S-65
American Platinum Works, The, 231 New Jersey Railroad Ave., Newark 5, N. J. C-17, C-19, C-21
American Tool & Machine Co., Hyde Park, Mass. 826
American Water Softener Co., Fourth & Lehigh Ave., Philadelphia 33, Pa. S-64
American Well Works, The, Aurora, Ill. C-160
Amersil Co., 685 Ramsey Ave., Hillside, N. J. C-17, C-19, C-21
Ampco Metal, Inc., 1745 S. Thirty-Eighth St., Milwaukee, 46, Wis. 913
Analytical Chemistry, 115 16th St. N. W., Washington 6, D. C. 1
Analytical Chemistry, 430 Park Ave., New York 22, N. Y. 1
Analytical Measurements, Inc., 585 Main St., Chatham, N. J. 443
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Associated Cooperage Industries of America, Inc., The, 408 Olive St., St. Louis 2, Mo. 818
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B-I-F Industries, Inc., 345 Harris Ave., Providence 1, R. I. 902

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Babcox & Wilcox Co., The, Tubular Products Div., Beaver Falls, Pa. 75
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Baker Perkins Inc., Chemical Machinery Div., Saginaw, Mich. 540-544
Barco Mfg. Co., 500 N. Hough St., Barrington, Ill. C-20
Barnebey-Cheney Co., Cassaday at Eighth, Columbus 19, Ohio 17
Barnstead Still & Sterilizer Co., 2 Lanesville Terrace, Forest Hills, Boston 31, Mass. 636
Barrett-Cravens Co., 630 Dundee Rd., Northbrook, Ill. 634 & 733
Bart Mfg. Corp., Belleville 9, N. J. S-107
Bart-Messing Corp., Belleville 9, N. J. S-107
Bartlett & Snow Co., The C. O., 6200 Harvard Ave., Cleveland 5, Ohio 247
Bean Div., John, Food Machinery and Chemical Corp., Box 840, Lansing 4, Mich. 324-326
Beaumont Birch Co., 1505 Race St., Philadelphia 2, Pa. 445
Beckman, Inc., Arnold O., 1020 Mission St., South Pasadena, Calif. 643
Beckman Div. Beckman Instruments, Inc., Fullerton, Calif. 20
Bemis Bro. Bag Co., 408 Pine St., St. Louis 2, Mo. 13
Berger Mfg. Div., Republic Steel Corp., Canton, Ohio 535-539
Bethlehem Apparatus Co., 890 Front St., Hellertown, Pa. C-148
Biach Industries, Inc., 10 Indian Spring Rd., Cranford, N. J. C-131
Bird Machine Co., South Walpole, Mass. 321, 325
Bishop & Co., J., Platinum Works, Malvern, Pa. 809
Black Products Co., 135th St. & Calumet Ave., Chicago 27, Ill. C-113
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Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa. 103
Blickman, Inc., S., Weehawken, N. J. 407
Bogue Electric Mfg. Co., 52 Iowa Avenue, Paterson, N. J. 421
Bolt & Nut Div., Republic Steel Corp., Cleveland, Ohio 535-539
Bowen Engineering, Inc., North Branch, N. J. 613
Brabender Corp., Rochelle Park, N. J. C-35
Brinkmann & Co., C. A., 378-380 Great Neck Rd., Great Neck, N. Y. C-36
Brookfield Engineering Laboratories, Inc., Stoughton, Mass. 424
Brooks Rotameter Co., Lansdale, Pa. 606
Brown Fintube Co., Elyria, Ohio 948

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Buffalo Meter Co., 2917 Main St., Buffalo 14, N. Y.	442
Buflovak Equipment Div. of Blaw-Knox Co., Buffalo 11, N. Y.	103
Builders-Providence, Inc., 345 Harris Ave., Providence 1, R. I.	902

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Callery Chemical Co., Callery, Pa.	C-59
Cambridge Instrument Co., Grand Central Terminal, New York 17, N. Y.	926
Cambridge Wire Cloth Co., The, Cambridge, Md.	214
Carbon Div., Great Lakes Carbon Corp., 18 East 48th St., New York 17, N. Y.	306-308
Carborundum Co., The, Niagara Falls, N. Y.	347
Carborundum Metals Co., The, Div. of The Carborundum Co., Box 32, Akron, N. Y.	347
Carlisle Gas Burners, Millville, N. J.	C-141
Carpenter Steel Co., The Alloy Tube Div., Union, N. J.	832
Carrier Conveyor Corp., 211 North Jackson St., Louisville, Ky.	117
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Catalytic Combustion Corp., 4544 Grand River Ave., Detroit 8, Mich.	C-133
Centrico Inc., 75 West Forest Ave., P. O. Box 349, Englewood, N. J.	731
Cesco, 4025 Sebastopol Highway, Santa Rosa, Calif.	S-68
Chain Belt Co., Milwaukee 1, Wisc.	432
Chamberlain Engineering Corp., Akron, Ohio	10-12-14
Chemical Abstracts, 430 Park Ave., New York 22, N. Y.	71
Chemical Div., National Lead Co., 111 Broadway, New York 6, N. Y.	706
Chemical Engineering, 330 West 42nd St., New York 36, N. Y.	501
Chemical Engineering Catalog, 430 Park Ave., New York 22, N. Y.	71
Chemical and Engineering News, 1155 16th St., N. W., Washington 6, D. C.	1
Chemical and Engineering News, 430 Park Ave., New York 22, N. Y.	71
Chemical Engineering Progress, 25 West 45th St., New York 36, N. Y.	828
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Chemical Plants Div., of Blaw-Knox Co., Pittsburgh 30, Pa.	103
Chemical Week, 330 West 42nd St., New York 36, N. Y.	501
Chemicolloid Laboratories, Inc., 55 Herricks Rd., Garden City Park, N. J.	22
Chemineer, Inc., 1044 East First St., Dayton 2, Ohio	C-155
Chempump Corp., 1300 Mermaid Lane, Philadelphia 18, Pa.	314-316
Chiksan Co., Brea, Calif.	607
Cleveland Mixer Co., The, Cannon at Aurora Roads, Bedford Heights, Cleveland, Ohio	825
Cleveland Vibrator Co., The, 2828 Clinton Ave., Cleveland 13, Ohio	S-112, S-114
Cleveland Worm & Gear Co., The, 3249-59 E. 80th St., Cleveland 4, Ohio	72
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Colton Co., Arthur, Div. of Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich.	301
Combustion Engineering, Inc., Raymond Div., 1315 N. Branch St., Chicago 22, Ill.	68
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Conkey Filter Unit, General American Transportation Corp., 380 Madison Ave., New York 17, N. Y.	42-44
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Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.	639
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Continental Diamond Fibre Co., Newark, Del.	534
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Darco Dept. Atlas Powder Co., 60 East 42nd St., New York 17, N. Y.	302-304 & 401
Davenport Machine and Foundry Co., 1628-66 West Fourth St., Davenport, Iowa	C-39
Davis Instruments Div. of Davis Emergency Equipment Co., Inc., 47 Halleck St., Newark 4, N. J.	939
Day Company, The, P. O. Box 25, Minneapolis, Minn.	5
Day Co., The J. H., Cincinnati 22, Ohio	921-925
Dean Products, Inc. Thermo-Panel Div., 1042 Dean St., Brooklyn 38, N. Y.	744
DeLaval Separator Co., The, Poughkeepsie, N. Y.	C-16
Delaware Barrel & Drum Co., Inc., P. O. Box 1648, Wilmington, Del.	C-25
Derrick Mfg. Co., 1754 Walden Ave., Buffalo 25, N. Y.	C-28
DeZurik Shower Co., Sartell, Minn.	423
Dicalite Div., Great Lakes Carbon Corp., 612 S. Flower St., Los Angeles 17, Calif.	306-308
Dore Co., John L., P. O. Box 7772, Houston 7, Tex.	C-139
Dorr-Oliver Inc., Barry Pl., Stamford, Conn.	513-517
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.	714
Dracco Corp., Harvard Ave. & E. 116th St., Cleveland 5, Ohio	808
Dudco Div., The New York Air Brake Co., 1796 East Nine Mile Rd., Detroit, Mich.	333-335
du Pont de Nemours & Co., Inc., E. I., Textile Fibers Dept., Wilmington 98, Del.	813
Duralab Equipment Corp., 979 Linwood St., Brooklyn 8, N. Y.	C-57
Durametallic Corp., 2104 Factory St., Kalamazoo, Mich.	223
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Duriron Co., Inc., The, Enzinger Div., P. T. Box 71, Angola, N. Y.	34
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Dustex Corp., P. O. Box 2520, Buffalo 25, N. Y.	413

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Eclipse Fuel Engineering Co., Rockford, Illinois	747
Eco Engineering Co., Div. of Economy Faucet Co., 12 New York Ave., Newark 1, N. J.	647
Eiche & Associates, Inc., R. J., 30 Church St., New York 7, N. Y.	C-123, C-127
Eimco Corp., The, 634-666 South Fourth West St., Salt Lake City 10, Utah	C-9
Electric Hotpack Co., The, Cottman Ave. at Melrose St., Philadelphia, Pa.	933
Electrode Div., Great Carbon Corp., 18 East 48th St., New York 17, N. Y.	306-308
Emery Industries, Inc., Cincinnati 2, Ohio	718
Emsco Mfg. Co., Swivel Fittings Department, P. O. Box 2098, Terminal Annex, Los Angeles 54, Calif.	C-123, C-127
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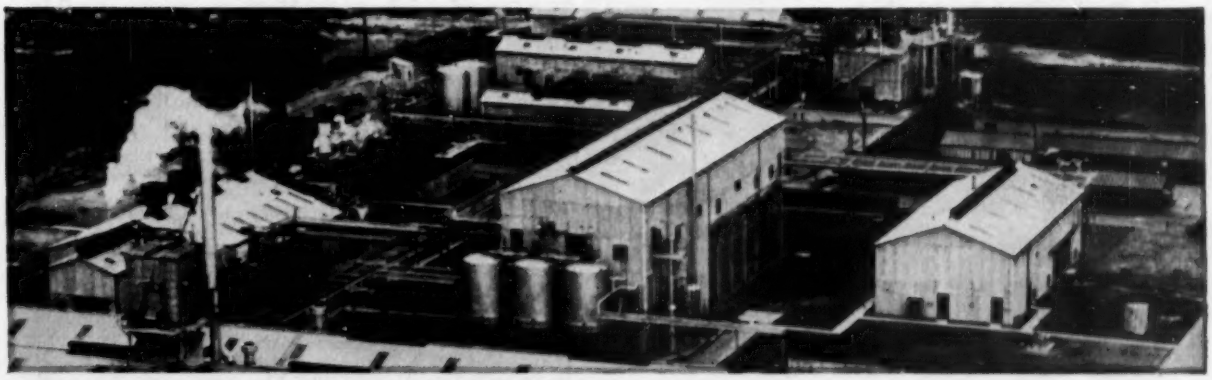
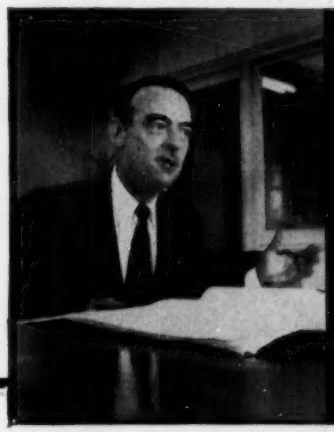
Enzinger Div., The Duriron Co., P. O. Box 71, Angola, N. Y.	34
Eriez Mfg. Co., Erie 6, Pa.	C-157
Ertel Engineering Corp., Kingston, N. Y.	614

NEW DEVELOPMENTS

4th and 5th PVC Projects Will Use SD's Suspension Process



Recently completed mono and polyvinyl chloride plant designed by SD.



"Less than a year will be required from initial design to commercial operation of the new Thompson Chemical Company PVC plant," according to Thomas P. Brown, Vice-President of SD. "Process design and detailed engineering of the new plant will be finished in a relatively short time because of SD's previous design experience with both small and large PVC plants."

From Henry F. Peters, SD's Assistant Vice-President of Engineering, "As a subsidiary of The Pantasote Company, the Eleonora Chemical Corporation's new PVC plant will produce resin for the parent company's line of plastic film and sheeting. In addition to process design and detailed engineering, SD, as prime contractor, will have full responsibility for construction of the plant as well as initial operation."

New PVC Plants Will Produce Resins of High Purity and Versatility

Since 1951, when only about half the PVC used was produced by the suspension process, this process has been steadily gaining ground. The reason? PVC produced by suspension process costs less to manufacture, has fewer impurities, and greater versatility in application.

SD's suspension process was first proved in collaboration with one of the largest European chemical firms. Subsequently SD designed the General Tire & Rubber Company's $6,000,000 integrated mono and polyvinyl chloride plant in Ashtabula, Ohio.

In design and engineering of these plants, SD's technical staff conceived and designed a flexible, standardized plant. These plants, with production capacities of four to fifteen million pounds, allow manufacturers of plastic products to produce their own PVC for their special requirements. One of these plants is now underway for another leading American manufacturer.

The Thompson Chemical Company and Eleonora Chemical Corporation represent SD's 4th and 5th PVC contracts. There are two reasons for SD's position in this field. First, SD has extremely broad process design experience in the PVC field. Second, SD offers a complete service, assuming entire responsibility from the basic process design and detailed engineering, through construction and initial operation.

On this or any other organic chemical plant design problem, SD's services are available to you on a confidential basis. In new plant construction or the revamping of existing facilities to increase production efficiencies, you will profit by utilizing SD's specialized experience in organic chemicals plant design.

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Engineering Offices:
Jersey City, New Jersey

Name of Exhibitor	Booth No.
Exact Weight Scale Co., The, 944 W. Fifth Ave., Columbus 8, Ohio	C-12
Exolon Co., The, Tonawanda, N. Y.	609

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Ferranti Electric, Inc., 30 Rockefeller Plaza, New York 20, N. Y.	S-67
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Filtros Inc., East-Rochester, N. Y.	419
Fischbein Co., Dave, 38 Glenwood Ave., Minneapolis 3, Minn.	640
Fischer & Porter Co., Hatboro, Pa.	200, 202
Fitzpatrick Co., The W. J., 1001 West Washington Blvd., Chicago 7, Ill.	140
Fletcher Works, Inc., Glenwood Ave. & Second St., Philadelphia 40, Pa.	102
Flexitallic Gasket Co., Eighth & Bailey Sts., Camden 1, N. J.	732
Food Engineering, 330 West 42nd St., New York, N. Y.	501
Food Machinery and Chemical Corp., John Bean Div., Box 840, Lansing 4, Mich.	324-326
Food Machinery and Chemical Corp., Peerless Pump Div., 301 West Ave. 26, Los Angeles 31, Calif.	805
Foster Engineering Co., 835 Lehigh Ave., Union, N. J.	208
Foxboro Co., The, Foxboro, Mass.	139
Fuller Co., Fuller Bldg., Catasauqua, Pa.	213
Fulton Bag & Cotton Mills, 1400 Annunciation St., P. O. Box 198, New Orleans 3, La.	820

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Gabb Special Products Div., The E. Horton & Son Co., Windsor Locks, Conn.	C-122
Garlock Packing Co., The, Palmyra, N. Y.	405
General Alloys Co., 367-405 West First St., Boston 27, Mass.	748
General American Transportation Corp., 135 S. LaSalle St., Chicago 90, Ill.	42-44
General Ceramics Corp., Keasbey, N. J.	37
General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N. Y.	850
Girdler Co., The, Catalyst Dept. of Gas Processes Div., Div. of National Cylinder Gas Co., Louisville 1, Ky.	47
Girdler Co., The, Votator Div., Div. of National Cylinder Gas Co., Louisville 1, Ky.	45
Glascote Products, Inc., Subsidiary of A. O. Smith Corp., 20900 St. Clair Ave., Cleveland 17, Ohio	106
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Great Western Mfg. Co., Leavenworth, Kansas	741-743
Greif Bros. Cooperage Corp., The, P. O. Box 398, Lindenhurst, N. Y.	76
Grinnell Co., Providence 1, R. I.	50
Grip-Strut Div., The Glove Co., 4000 S. Princeton Ave., Chicago 9, Ill.	735, 737
Gross Co., F. R., 592 Crestview Ave., Akron, Ohio	C-137
Gump Co., B. F., 1325 S. Cicero Ave., Chicago 50, Ill.	23

H

Hamer Valves, Inc., P. O. Box 1187, Long Beach 6, Calif.	C-123, C-127
Hamilton Mfg. Co., Two Rivers, Wis.	C-161
Hanovia Chemical & Mfg. Co., 100 Chestnut St., Newark 5, N. J.	C-17, C-19, C-21
Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.	917
Hardinge Co., York, Pa.	4
Hardinge Mfg. Co., 240 Arch St., York, Pa.	4
Harman Associates, F. Ward, Halesite, L. I., N. Y.	715
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Haynes Stellite Co., Div. of Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, New York	350
Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, Ohio	622-624
Hermas Machine Co., Hawthorne, N. J.	C-117
Hercules Filter Corp., 175 Ethel Ave., Hawthorne, N. J.	78
Hewit-Robins Inc., Glenbrook P. O., Stamford, Conn.	C-14
Heyl & Patterson, Inc., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.	226
High Pressure Equipment Co., 1222 Linden Ave., P. O. Box 1174, Erie, Pa.	717
Hills-McCanna Co., 3025 North Western Ave., Chicago 18, Ill.	222
Hockmeyer & Co., Herman, 341 Coster St., New York 59, N. Y.	C-61
Hoke Inc., South Dean St., Englewood, N. J.	935
Homestead Valve Mfg. Co., Coraopolis, Pa.	S-38 & S-77
Hough Co., The Frank G., Libertyville, Ill.	69
Howe Scale Co., The, Rutland, Vt.	332
Hungerford & Terry, Inc., Clayton, N. J.	205
Hunt Machine Co., Rodney, Mills Street, Orange, Mass.	821
Hydreco Div., The New York Air Brake Co., 1100 East 222nd St., Cleveland 17, Ohio	333-335

I

Illinois Water Treatment Co., Rockford, Ill.	630
Imperial Brass Mfg. Co., The, 1200 W. Harrison St., Chicago 7, Ill.	439-441
Industrial Div., Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.	531
Industrial and Engineering Chemistry, 1155 16th St., N. W., Washington 6, D. C.	1
Industrial and Engineering Chemistry, 430 Park Ave., New York 22, N. Y.	71
Industrial Filter & Pump Mfg. Co., 5900 Ogden Ave., P. O. Box 151, Chicago 50, Ill.	51-53
Industrial Laboratories Publishing Co., 201 North Wells St., Chicago 6, Ill.	C-149
Industrial Steels, Inc., 255 Bent St., Cambridge 41, Mass.	726
Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.	918
Insul-Mastic Corp. of America, 7750 West 61st Pl., Summit, Ill.	444
International Boiler Works Co., The, East Stroudsburg, Pa.	548
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International Nickel Co., The, 67 Wall St., New York 5, N. Y.	507

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Jamesburg Corp., 62 Millbrook St., Worchester 5, Mass.	S-113
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Jeffrey Mfg. Co., The, Columbus 16, Ohio	201
Jenkins Bros., 100 Park Ave., New York 17, N. Y.	147
Jerguson Gage & Valve Co., 87 Fellsway, Somerville 45, Mass.	C-132
Johns-Manville Sales Corp., 22 East 40th St., New York 16, N. Y.	508
Journal of Agricultural and Food Chemistry, 1155 16th St., N. W., Washington 6, D. C.	1
Journal of Agricultural and Food Chemistry, 430 Park Ave., New York 22, N. Y.	71

K

Kanigen Div., General American Transportation Corp., 135 S. LaSalle St., Chicago 90, Ill.	42-44
Kellogg Co., The M. W., Chemical Mfg. Div., P. O. Box 469, Jersey City 3, N. J., Chemical Process Div., 225 Broadway, New York 7, N. Y.	835-839-843
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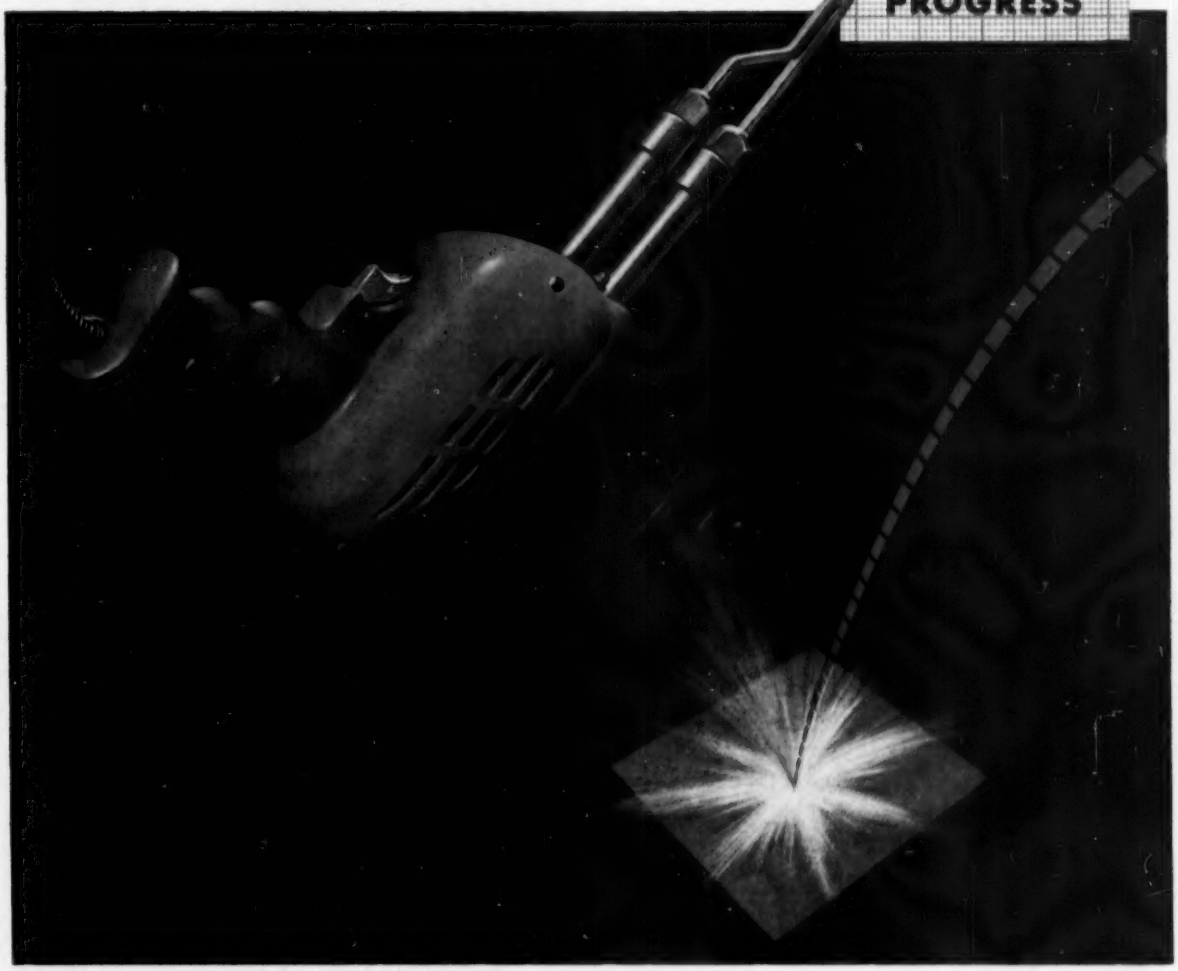

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Kinetic Dispersion Corp., 95 Botsford Pl., Buffalo 16, N. Y.	C-118
Kinney Mfg. Co., Subsidiary of The New York Air Brake Co., 3529-3541 Washington St., Boston 30, Mass.	333-335
Knapp Mills, Inc., 23-15 Borden Ave., Long Island City 1, N. Y.	19
Knight, Maurice A., Kelly Ave., Akron, Ohio	7
Komline-Sanderson Engineering Corp., Peapack, N. J.	C-151
Kontes Glass Co., Vineland, N. J.	C-154
Koppers Co., Metal Products Div., 200 Scott St., Baltimore, Md.	121-125
Koven & Brother, Inc., L. O., 154 Ogden Ave., Jersey City 7, N. J.	834

L

Laboratory Equipment Corp., P. O. Box 352, St. Joseph, Mich.	C-124
Laboratory Furniture Co., Inc., Old Country Rd., P. O. Box 590, Mineola, N. Y.	414
Laboratory Glass Supply Co., 610 West 150th St., New York 31, N. Y.	C-135
LaBour Co., The, Elkhart, Ind.	31
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Lapp Insulator Co., Inc., Process Equipment Div., Leroy, N. Y.	814
Lawrence Pumps, Inc., 371 Market St., Lawrence, Mass.	320-322
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Lebanon Steel Foundry, Lebanon, Pa.	134
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Lehmann Company, Inc., J. M., 550 New York Ave., Lyndhurst, N. J.	C-43
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Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.	532
Liston-Becker Plant, Beckman Instruments, Inc., 649 Hope St., Springdale, Conn.	836
Logan Emergency Showers, Inc., P. O. Box 11, Glendale, Calif.	C-142
Louisville Drying Machinery Co., Unit, General American Transportation Corp., 139 S. Fourth St., Louisville, Ky.	42-44
Lovejoy Flexible Coupling Co., 4949 W. Lake Street, Chicago 44, Ill.	448
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Machlett & Son, E., 220 East 23rd St., New York 10, N. Y.	C-33
Magnetic Engineering & Mfg. Co., 851 Van Houten Ave., Clifton, N. J.	236
Magnetrol, Inc., 2110 S. Marshall Blvd., Chicago 23, Ill.	431
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Martin & Co., H. S., 1919-20 Greenleaf St., Evanston, Ill.	C-138 & C-140
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McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y.	427
McGraw Hill Publishing Co., 330 West 42nd St., New York 36, N. Y.	501
Merco Centrifugal Co., 150 Green St., San Francisco 11, Calif.	2
Metal Textile Corp., 647 East First Ave., Roselle, N. J.	C-65
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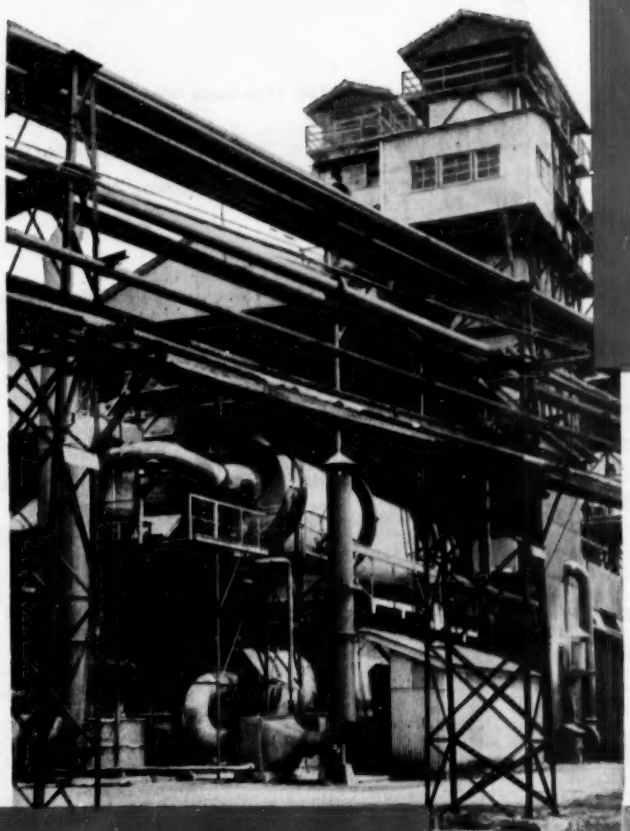
Mettler Instrument Corp., Box 242, Hightstown, N. J.	18
Metalweld, Inc., Scotts Lane & Abbotsford Ave., Philadelphia 29, Pa.	240
Mic-Lin Co., Cornell Ave., Merchangville, N. J.	S-71
Miller & Son, Inc., Franklin P., Supreme Crusher Div., 36 Meadow St., East Orange, N. J.	S-31
Milton Roy Company, 1300 East Mermaid Lane, Chestnut Hill, Philadelphia 18, Pa.	313
Mine Safety Appliances Company, 201 North Braddock Ave., Pittsburgh 8, Pa.	C-34
Minerals & Chemicals Corp. of America, Menlo Park, N. J.	807
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.	531
Misco Fabricators, Inc., 1999 Guoin St., Detroit 7, Mich.	723
Mission Mfg. Co., Centrifugal Pump Div., P. O. Box 4209, Houston 14, Texas	C-147
Missouri Coke & Chemical Div., Great Lakes Carbon Corp., 3570 Lindell Blvd., St. Louis 3, Mo.	306-308
Mixing Equipment Co., 135 Mt. Read Blvd., Rochester 11, N. Y.	800
Monarch Mfg. Works, Inc., 2501 E. Ontario St., Philadelphia 34, Pa.	701
Morehouse-Cowles Inc., 1156 San Fernando Rd., Los Angeles 65, Calif.	C-22
Mud Products Inc., Phil-Towder Bldg., Tulsa, Okla.	824
Mutti Metal Wire Cloth Co., Inc., 1350 Garrison Ave., New York 59, N. Y.	204
Murray Co., A. B., Elizabeth, N. J.	S-32
Murray Tube Works, Inc., The, Elizabeth, N. J.	S-32

N

Naresco Equipment Corp., Subsidiary of National Research Corp., 160 Charlemont St., Newton Highlands 61, Mass.	C-115
Nash Engineering Co., The, South Norwalk, Conn.	400
National Carbon Co., Div. of Union Carbide and Carbide Corp., 30 East 42nd St., New York 17, N. Y.	350
National Drying Machinery Co., The, Lehigh Ave. & Hancock St., Philadelphia 33, Pa.	C-62
National Dust Collector Corp., 549 West Washington Blvd., Chicago 6, Ill.	232
National Engineering Co., Simpson Mix-Muller Div., 549 West Washington Blvd., Chicago 6, Ill.	232
National Filter Media Corp., The, 1717 Dixwell Ave., New Haven 14, Conn.	616
National Lead Co., 111 Broadway, New York 6, N. Y.	702, 706, 708
National Rosin Oil Products, Inc., Savannah, Ga.	64
National Tube Div., United States Steel Corp., 525 William Penn Pl., Pittsburgh 30, Pa.	518-522
Neumann & Weaver, Inc., 22-12 Raphael St., Fair Lawn, N. J.	C-169
Newark Wire Cloth Co., 351 Venora Ave., Newark 4, N. J.	334
New Brunswick Scientific Co., P. O. Box 606, New Brunswick, N. J.	626
New England Tank & Tower Co., Everett, Mass.	52
New York Air Brake Co., The, 230 Park Ave., New York 17, N. Y.	333-335
New York Laboratory Supply Co., Inc., 76 Varick St., New York 13, N. Y.	C-41
Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y.	600
Niagara Filters Div., American Machine and Metals, Inc., East Moline, Ill.	802-806
Nichols Engineering & Research Corp., 70 Pine St., New York 5, N. Y.	631
Nicholson & Co., W. H., 12 Oregon St., Wilkes-Barre, Pa.	132
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio	535-539
Nordstrom Valve Div., Rockwell Mfg. Co., North Lexington Ave., Pittsburgh 8, Pa.	617
North American Philips Co., 750 South Fulton Ave., Mt. Vernon, N. Y.	648

O

Oil & Gas Div., Great Lakes Carbon Corp., 18 East 48th St., New York 17, N. Y.	306-308
Okadee Valve Co., 332 So. Michigan Ave., Chicago, Ill.	824



95% ammonia efficiency

in the CHEMICO Urea Process

These Urea Prills made by the Chemico Urea Process for use as fertilizer contain 46% Nitrogen.

76% conversion of ammonium carbamate to urea

The Chemico Urea Process is employed in a 120 standard tons per day Urea Plant, shown in the photograph, which went into operation in the Fall of 1952 at Niihama, Japan, for the Sumitomo Chemical Company.

This same process is being used for a 90 short tons per day Urea Plant which Chemico is presently designing for Nihon Gas Kagaku Kogyo, Japan.

Chemico Urea Process operating records show an actual conversion of 76% in the presence of 200% excess ammonia. Theoretical maximum conversion when the stoichiometric feed ratio is used is only 48%.

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CCS97

Name of Exhibitor	Booth No.
Omega Machine Co., 345 Harris Ave., Providence 1, R. I.	902
Oronite Chemical Co., 200 Bush St., San Francisco 20, Calif.	C-23
Owens-Corning Fiberglas Corp., Toledo 1, Ohio	618-620

P

Pangborn Corp., Hagerstown, Md.	906
Parker Appliance Co., The, 17325 Euclid Ave., Cleveland 12, Ohio	74
Parks-Cramer Co., Fitchburg, Mass.	727
Patterson Foundry & Machine Co., The, East Liverpool, Ohio	331
Patterson-Kelley Co., The, East Stroudsburg, Pa.	739, 831
Peabody Engineering Corp., 580 Fifth Ave., New York 36, N. Y.	C-116
Peerless Pump Div., Food Machinery and Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.	805
Penberthy Injector Co., Div. of Buffalo-Eclipse Corp., 1242 Holden Ave., Detroit 2, Mich.	426
Perkin-Elmer Corp., The, Norwalk, Conn.	705
Perlite Div., Great Lakes Carbon Corp., 612 South Flower St., Los Angeles 17, Calif.	306-308
Permutit Co., The, 330 West 42nd St., New York 36, N. Y.	73
Perry Products Co., 1421 North Sixth St., Philadelphia 22, Pa.	437
Petro-Chem Development Co., Inc., 122 East 42nd St., New York 17, N. Y.	C-44
Pfaudler Co., The, 1000 West Ave., Rochester 3, N. Y.	502
Pharmaceutical and Chemical Industry Supply Corp., 16 Hudson St., New York 13, N. Y.	C-55
Philadelphia & Suburban Tire Service, 6215 Baltimore Ave., Yeadon, Pa.	S-115
Philadelphia Gear Works, Inc., G St. below Erie Ave., Philadelphia 34, Pa.	33
Philadelphia Pump Machinery Co., 1513 Race St., Philadelphia, Pa.	C-130
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.	635
Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.	38
Pla-Tank, Inc., Div. of The Chemical Corp., West Warren, Mass.	C-120
Plate & Welding Div., General American Transportation Corp., 135 S. La Salle St., Chicago 90, Ill.	42-44
Platecoil Div., Tranter Mfg., Inc., Lansing 4, Mich.	340-342-344
Pneumatic Scale Corp., Ltd., 65 Newport Ave., North Quincy 71, Mass.	77
Podbielniak, Inc., 341 E. Ohio St., Chicago 11, Ill.	601
Poly-Seal Corp., The, 405 Lexington Ave., New York 17, N. Y.	S-28
Popper & Sons, Inc., 300 Fourth Ave., New York 10, N. Y.	907
Porter Co., H. K. Watson-Stillman Fittings Div., P. O. Box 95, Roselle, N. J.	722
Potter Aeronautical Co., P. O. Box 532, Route 22, Union, N. J.	C-40
Potts Co., Horace T., Speedline Stainless Steel Fittings Div., Erie Ave. & D St., Philadelphia 34, Pa.	307
Powell Co., The Wm., 2503-31 Spring Grove Ave., Cincinnati 22, Ohio	48
Prater Pulverizer Co., 1515 S. 55th Court, Chicago 50, Ill.	336-338
Precision Scientific Co., 3737 West Cortland St., Chicago 47, Ill.	67
Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia 30, Pa.	S-66
Premier Mill Corp., Geneva, N. Y.	309
Pressed Steel Tank Co., 1445 So. 66 St., West Allis 14, Wis.	714
Pressure Products Industries, Inc., Hatboro, Pa.	C-37
Proctor & Schwartz, Inc., 7th St. & Tabor Road, Philadelphia 20, Pa.	950
Productive Equipment Corp., 2926 W. Lake St., Chicago 12, Ill.	207
Progressive Architecture, 430 Park Ave., New York 22, N. Y.	71
Proportioneers, Inc., 345 Harris Ave., Providence 1, R. I.	902
Protectoseal Co., The, 1920 South Western Ave., Chicago 8, Ill.	C-38
Pulva Corp., 550 High St., Perth Amboy, N. J.	330
Pulverizing Machinery Div., Metals Disintegrating Co., Inc., Chatham Road, Summit, N. J.	C-30
Putman Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.	610

Q

Quaker Oats Co., The, Chemicals Dept., Merchandise Mart Plaza, Chicago 54, Ill.	65
Quaker Oats Co., The Electrostatic Div. of Mechanical Research Dept., Mohawk Bldg., 205 Water St., Akron 8, Ohio	15
Quelcor, Inc., Front & Broomall Sts., Chester, Pa.	348

R

R. K. L. Valve & Mfg. Co., 1623 Elaine St., Philadelphia 19, Pa.	S-71
Raybestos-Manhattan, Inc., Packing Div., Manheim, Pa.	218
Raymond Div., Combustion Engineering, Inc., 1315 North Branch St., Chicago 22, Ill.	68
Read Standard Corp., York, Pa.	608
Reeves Pulley Co., Columbus, Ind.	C-165, C-167
Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.	71
Rem-Cru Titanium, Inc., Midland, Pa.	433
Republic Lead Equipment Co., Cleveland, Ohio	10-12-14
Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio	535-539
Research Controls, P. O. Box 5035, Tulsa, Okla.	C-134
Resistoflex Corp., Belleville 9, N. J.	248
Reynolds Metals Co., 2500 South Third St., Louisville 1, Ky.	436
Rheem Manufacturing Co., 7600 South Kedzie Ave., Chicago 29, Ill.	621, 625
Richmond Manufacturing Co., Lockport, N. Y.	6
Rietz Mfg. Co., 150 Todd Road, Santa Rosa, Calif.	719, 721
Robbins & Myers, Inc., Pump Div., Springfield, Ohio	32
Rochester Mfg. Co., Inc., Rochester 10, N. Y.	422
Rockwell Mfg. Co., 400 North Lexington Ave., Pittsburgh 8, Pa.	617
Ross & Son Co., Charles, 148-156 Classon Ave., Brooklyn 5, N. Y.	447
Roth Co., Roy E., 2420 Fourth Ave., Rock Island, Ill.	S-37
Rotherm Engineering Co., Inc., 7280 West Devon Ave., Chicago 31, Ill.	C-143
Rubicon Co., Ridge Ave. at 35th St., Philadelphia 32, Pa.	745
Ruggles-Coles Engineering Co., 240 Arch St., York, Pa.	4

S

Sadtler & Son, Inc., Samuel P., 1517 Vine St., Philadelphia 2, Pa.	C-144
Safety Car Heating and Lighting Co., The Entoleter Div., P. O. Box 904, New Haven 4, Conn.	703
Saran Lined Pipe Co., 2415 Burdette Ave., Ferndale, Mich.	343
Sarco Co., Empire State Bldg., New York 1, N. Y.	C-128
Sauereisen Cements Co., Pittsburgh 15, Pa.	S-26
Schneible Co., Claude B., P. O. Box 81, North End Station, Detroit 2, Mich.	900
Schutz-O'Neill Co., 307 Portland Ave., Minneapolis 15, Minn.	418
Scientific Development Co., Box 795, State College, Pa.	713
Scientific Glass Apparatus Co., 100 Lakewood Terrace, Bloomfield, N. J.	54
Scott Aviation Corp., Lancaster, N. Y.	C-159
Sealol Corp., 45 Willard Ave., Providence 5, R. I.	S-25
Selas Corp. of America, Erie Ave & D St., Philadelphia 34, Pa.	62
Sel-Rex Precious Metals, Inc., Belleville 9, N. J.	S-107
Sharples Corp., The, 2300 Westmoreland St., Philadelphia 40, Pa.	C-29
Sharples Corp. Research Laboratories, The, 424 W. Fourth St., Bridgeport, Pa.	C-29

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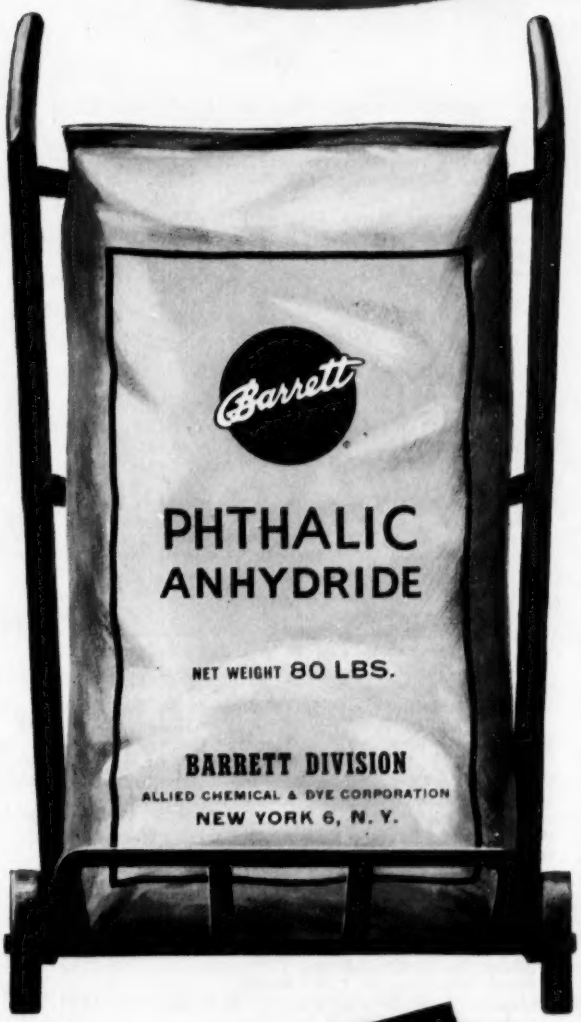

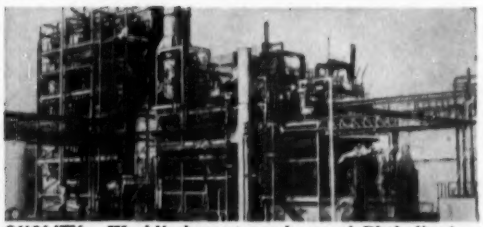

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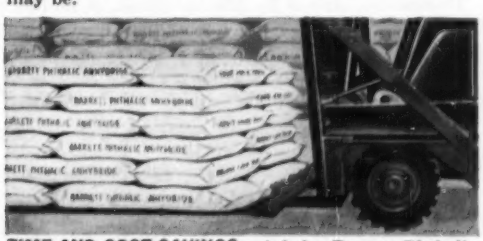

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Allied Chemical

OVER 100 YEARS OF EXPERIENCE

Name of Exhibitor	Booth No.
Sheldon Equipment Co., E. H. Muskegon, Mich.	C-64
Sier-Bath Gear & Pump Co., 9252 Hudson Blvd., North Bergen, N. J.	55
Simplicity Engineering Co., Durand, Mich.	822
Simpson Mix-Muller Div., National Engineering Co., 549 West Washington Blvd., Chicago 6, Ill.	232
Sly Mfg. Co., The W. W., 4700 Train Ave., Cleveland 1, Ohio	43
Snyder Tool & Engineering Co., Arthur Colton Co. Div., 3400 E. Lafayette Ave., Detroit 7, Mich.	301
Southwestern Engineering Co., 4800 Santa Fe Ave., Los Angeles 58, Calif.	C-56, C-58
Sparkler Mfg. Co., Mundelein, Ill.	C-54
Speedline Stainless Steel Fittings Div., Horace T. Potts Co., Erie Ave. & D St., Philadephia 34, Pa.	307
Sperry & Co., D. R., Batavia, Ill.	632
Spraying Systems Co., 3201 Randolph St., Bellwood, Ill.	833
Sprout, Waldron & Co., Muncy, Pa.	109-111-113
Standard Steel Corp., 5001 Boyle Ave., Los Angeles 58, Calif.	801
Star Tank and Filter Corp., 875 Edgewater Rd., New York 59, N. Y.	129
Steel and Tubes Div., Republic Steel Corp., Cleveland, Ohio	535-539
Stoffel Seals Corporation, Tuckahoe, N. Y.	S-73
Stokes Machine Co., F. J., Philadelphia 20, Pa.	910
Strahman Valves, Inc., 16 Hudson St., New York 13, N. Y.	C-24
Sturtevant Mill Co., Park & Clayton Sts., Dorchester, Boston 22, Mass.	905
Superior Electric Company, The, Bristol, Conn.	C-13
Superior Tube Co., Norristown, Pa.	346
Swenson Evaporator Co., Div. of Whiting Corp., Harvey, Ill.	932

T

Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. C.	206
Tank Car Div., General American Transportation Corp., 135 S. La Salle St., Chicago 90, Ill.	42-44
Tank Storage Div., General American Transportation Corp., 135 La Salle St., Chicago 90, Ill.	42-44
Taylor Instrument Cos., 95 Ames St., Rochester 1, N. Y.	36
Technicon Co., The, Chauncey, N. C.	C-32
Terriss Div. of Consolidated Siphon Supply Co., Inc., 22-24 Wooster St., New York 13, N. Y.	244
Thermo Electric Co., Inc., Saddle River Township, Rochelle Park Post Office, N. J.	C-156, C-158
Thermo Panel Div., Dean Products, Inc., 1042 Dean St., Brooklyn 38, N. Y.	744
Thermon Mfg. Co., 1017 Rosine St., Houston, Tex.	S-34
Thomas Co., Arthur H., 230 So. 7th St., P. O. Box 779, Philadelphia 5, Pa.	16
Thomas Flexible Coupling Co., Warren, Pa.	225
Thropp Sons, Wm. R., Div. of J. M. Lehmann Co., 550 New York Ave., Lyndhurst, N. J.	C-43
Titanium Alloy Mfg. Div., National Lead Co., 111 Broadway, New York 6, N. Y.	708
Toledo Porcelain Enamel Products Co., Toledo, Ohio	824
Toledo Scale Co., Toledo 1, Ohio	750
Tolhurst Centrifugals Div., American Machine and Metals, Inc., E. Moline, Ill.	802-806
Torsion Balance Co., The, Clifton, N. J.	847
Tote System, Inc., Beatrice, Neb.	605
Tranter Mfg., Inc., Lansing 4, Mich.	340-342-344
Treadwell Construction Co., Midland, Pa.	729
Treen Box Co., Tioga and Memphis Sts., Philadelphia 34, Pa.	S-72
Trent, Inc., 201-299 Leverington Ave., Philadelphia 27, Pa.	803
Tri-Clover Div., Ladish Co., Kenosha, Wis.	26
Tri-Homo Corp., Salem, Mass.	305
Troy Engine & Machine Co., Troy, Pa.	547
Truscon Steel Co., Youngstown, Ohio	535-539
Tube Turns, Div. of National Cylinder Gas Co., Louisville 1, Ky.	49
Tube Turns Plastic, Inc., Louisville 1, Ky.	47
Turbo Mixer Div., General American Transportation Corp., 380 Madison Ave., New York 17, N. Y.	42-44
Tyler Co., The W. S., 3615 Superior Ave., Cleveland 14, Ohio	46

U

Uehling Instrument Co., 473 Getty Ave., Paterson, N. J.	217
Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N. Y.	350
Union Drawn Steel Div., Republic Steel Corp., Cleveland, Ohio	535-539
Union Steel Corp., 2150 Stanley Terrace, Union, N. J.	440
United Box & Lumber Co., 45 Wheeler Point Rd., Newark 5, N. J.	S-106
U. S. Electrical Motors, Inc., 200 East Slauson Ave., Los Angeles 54, Calif.	148
United States Gasket Co., Camden 1, N. J.	740
United States Steel Corp., 525 William Penn Pl., Pittsburgh 30, Pa.	518-522
United States Stoneware Co., The, 60 East 42nd St., New York 17, N. Y.	10-12-14

V

Van Nostrand Company, Inc., D., 120 Alexander St., Princeton, N. J.	435
Vanton Pump & Equipment Corp., Div. of Cooper Alloy Corp., 201 Sweetland Ave., Hillside, N. J.	602
Velan Engineering Ltd., 6585 Jeanne Mance St., Montreal, Quebec, Canada	209
Victor Chemical Works, 155 North Wacker Drive, Chicago 6, Ill.	650
Vogt Machine Co., Henry, 10th & Ormsby Sts. Louisville 10, Ky.	56

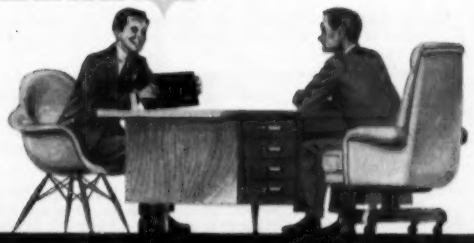
W

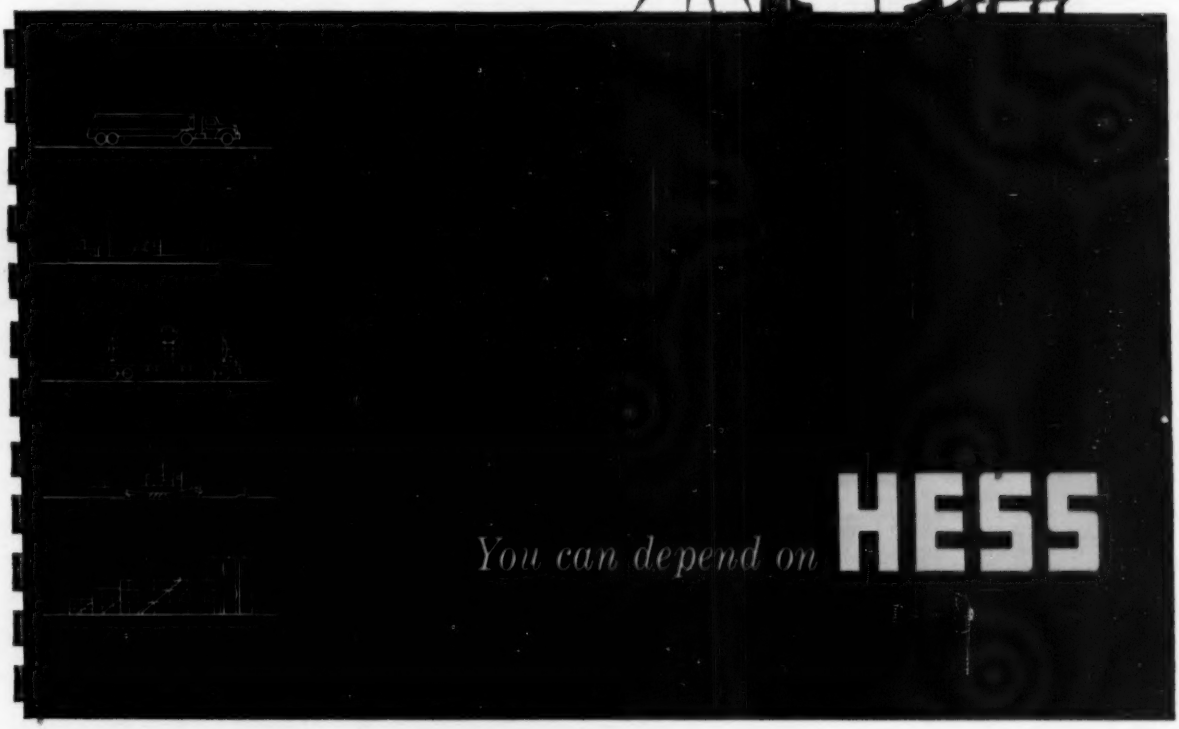
Walker-Wallace Div., A. P. V. Co., 137 Arthur St., Buffalo 7, N. Y.	543
Wall Colmonoy Corp., Stainless Processing Div., 19345 John R St., Detroit 3, Mich.	339
Wall-Derkiss, Inc., 575 Linden Ave. E., Linden, N. J.	339
Wall Gases, Inc., Bristol Pike, Morrisville, Bucks County, Pa.	339
Wallace & Tiernan Inc., 25 Main St., Belleville, N. J.	6
Walworth Co., 60 East 42nd St., New York 17, N. Y.	525
Warren Electronics, Inc., Bound Brook, N. J.	628
Warren Steam Pump Co., Warren, Mass.	227
Watertown Div., The New York Air Brake Co., Watertown, N. Y.	333-335
Watson-Stillman Fittings Div., H. K. Porter Co., P. O. Box 95, Roselle, N. J.	722
Welch Manufacturing Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.	C-42
Welding Fittings Corp., New Castle, Pa.	219
Western Machinery Co., 760-766 Folsom St., San Francisco 7, Calif.	C-63
Westinghouse Electric Corp., Gateway Center, 401 Liberty Ave., P. O. Box 868, Pittsburgh 30, Pa.	60
Wheelabrator Corp., Mishawaka, Ind.	133
Whitehead Metal Products Co., 303 West 10th St., New York 14, N. Y.	429
Whiting Corp., Swenson Evaporator Co. Div., Harvey, Ill.	932
Wiegand Co., Edwin L., 7500 Thomas Blvd., Pittsburgh 8, Pa.	810
Wiggins Gasholder Div., General American Transportation Corp., 135 S. La Salle St., Chicago 90, Ill.	42-44
Wiggins Vapor Seals Div., General American Transportation Corp., 135 S. La Salle St., Chicago 90, Ill.	42-44
Williams Patent Crusher and Pulverizer Co., 2701-2703 North Broadway, St. Louis 6, Mo.	709
Wolverine Tube Div. of Calumet & Hecla, Inc., 1850 Guardian Bldg., Detroit 26, Mich.	642-644
Worthington Corp., Harrison, N. J.	840-848

Y

Yarnall-Waring Co., Chestnut Hill, Philadelphia 18, Pa.	633
York Corp., Industrial Div., York, Pa.	402
York Co., Otto H., 6 Central Ave., W. Orange, N. J.	516
Young Radiator Co., Racine, Wis.	C-162

This important new book tells you how HESS BULK LIQUID STORAGE reduces distribution and manufacturing costs





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Progress is evidenced by new, more economical or improved products that do a job better or initiate new uses. Recent contributions to this end, made by Emery's pioneering spirit, can be summarized in:

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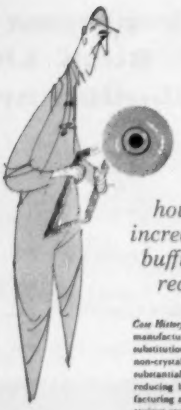
New Chemicals: Empol 1022 Polymerized Fatty Acid, Emerox 9110 Azelaic Acid and Emfac 1202 Pelargonic Acid offer unlimited opportunities for exploitation.

Textile Products: A group of modernized textile lubricants and finishing agents cope with the many new problems created by new, high-speed textile operations.

These main product lines, plus the new concepts in development and research stages, make Emery your logical source for information, ideas, solutions to problems on materials related to fatty acids and their derivatives. Contact us by writing Dept. I-11 or stop in to see us at Booth #718 at the Chem. Show, Dec. 5-9, Philadelphia.



how Emersol 120 increased strength of buffing bars and reduced breakage

Case History 17-41 This well-known manufacturer of buffing bars found that the substitution of crystalline Emersol 120 for a non-crystalline solid fatty acid increased substantially the strength of his bars, thus reducing breakage both during manufacturing and use. In addition to realizing the savings associated with lower breakage, an extra sales appeal of greater safety and economy in use was also gained. Furthermore, he found that the consistent composition and uniformity of Emersol 120 decreased the need for adjusting formulas during processing.

CASE HISTORY

Another tough problem solved by an Emery Product

HOW EMERSOL 9305 PRODUCED ARCHITECTURAL WHITES WITH BEST COLOR RETENTION

Because white enamels that stay white have a strong consumer sales appeal, this manufacturer made a thorough search for materials that would not yellow. After a comprehensive evaluation, he found that Emersol 9305 Double Distilled Liquid Fatty Acid gave the best color retention of all materials tested. At the same time the required 4-hour drying time, gloss retention, and other specifications of hardness, water and alkali resistance, were met fully.

The medium oil length alkyd (gel) was lighter in color than those made from competitive materials. Other plus-features of Emersol 9305 verified by this comprehensive evaluation, were its low odor, which facilitated handling and storage, and its high degree of uniformity between shipments.

To get whites or pastels with maximum color retention, profit from the experience of others and use Emersol 9305, an Emersol-processed liquid fatty acid, tailormade for high quality alkyd resins.

Emersol® 221 White Elaine eliminated breakdown of waterless hand cleaner

Case History No. 35-21 . . . A large manufacturer of waterless hand cleaners had numerous complaints on the separation of his product during normal shelf-life and use. Since a double-distilled oleic acid was a major part of the emulsifier in his formulation, he investigated our claims of superior stability for Emersol 221 Low Titer White Elaine.

Prolonged aging tests soon showed that Emersol 221 eliminated the breakdown of his cleaner even over abnormally long storage periods. Furthermore, his product stayed fresh and appealing longer because of its increased resistance to yellowing and rancidity. And since Emersol 221 costs no more than competitive double-distilled oleic acids, this substantially greater "sales-appeal" was achieved at no extra cost.

Another tough problem solved by an Emery Product

What price animal fatty acid?

How Grease Yield Increased, Penetration and Stability Improved—with Emery 531 Animal Fatty Acid

The temptation of low-price was too great for this reputable manufacturer of lubricating greases and he yielded to the apparent savings of low-cost fatty acids.

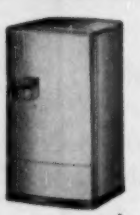
But, the savings were short-lived. The inevitable lower-quality that always accompanies lower-price, caused major trouble. Grease yields dropped off drastically, penetration standards couldn't be met, and stability went haywire.

After much hair-pulling and many dollars later, they found that improved Emery 531 Animal Fatty Acid corrected their difficulties and restored quality to acceptable standards. In fact, the performance of the Emery fatty acid was better than they had ever experienced and even eliminated some of their production and quality difficulties to which they had become inured.

Although you can save pennies on fatty acids, any inherent lower quality will cost you in the long run. So why risk the acceptability of your products, the good reputation of your company when you can be sure of consistent, top-performance with improved Emery 531 Fatty Acid. So . . . the next time you order be sure to order Emery 531 Animal Fatty Acid.

THE ODD CARBON MAKES PELARGONIC ACID DIFFERENT

for example: ***Emfac®*** *Pelargonic Acid Improves High-Bake Enamels 4 Ways!*



In this use in alkyd resins, the unique properties of pelargonic acid result in four distinct advantages over lauric and other coconut derived fatty acids. In addition to faster cooking of the resin itself, films of white enamel made from pelargonic acid are harder, exhibit higher gloss, and possess greater resistance to yellowing.

these essential ingredients ODD in the formulas

...but you get all 3 in Emery's 12-HYDROXYSTEARIC ACID and HYDROGENATED CASTOR OIL

technical service

Emery's Development and Service Laboratory—backed by the entire Research Department—is available to help you solve application problems involving fatty acids. This "extra" service, backed by years of extensive field experience with fatty acids, is yours when you buy Emery.

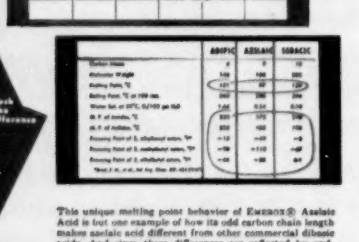
uniform quality

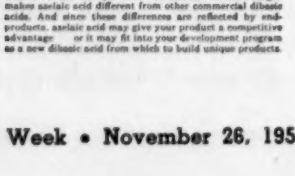
The improved high quality and excellent performance characteristics of Hydrox 642 12-Hydroxystearic Acid and Di-42 Hydrogenated Castor Oil is maintained at uniform grade by strict quality control. The combined efforts of research, development and control ensure highest uniform quality—every time you order from Emery!

convenience and economy

Outside of sales and service are given careful attention by Emery's 10 direct sales representatives located throughout the United States. Branch offices and additional warehouse points, coast to coast, are your assurance of quick service and fast shipments. Also, savings can be realized by combining less than carload lots of 12-hydroxystearic acid or hydrogenated castor oil with your other requirements of animal, vegetable or hydrogenated fatty acids, stearic and oleic acids.

The ODD Azelaic Acid





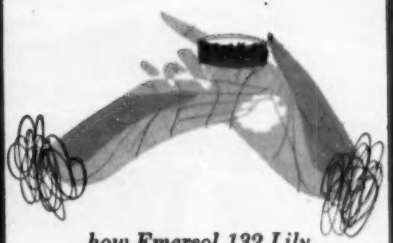
check the difference

This unique melting point behavior of EMEROX® Azelaic Acid is but one example of how its odd carbon chain length makes azelaic acid different from other commercial dibasic acids. And since these differences are reflected by end-products, azelaic acid may give your product a competitive advantage . . . or it may fit into your development program as a new dibasic acid from which to build unique products.

Emersol® 211 Elaine increased sales appeal of premium shampoo

Case History No. 22-42: A well-known manufacturer of premium shampoos replaced the ordinary single-distilled oleic acid in his formulation with Emersol 211 Low Titer Elaine because of its uniform color and greater resistance to color change during aging. The resultant uniform color of his shampoos produced greater consumer acceptance and subsequently greater sales.

While uniformity of color was this manufacturer's primary concern, he found also that Emersol 211's outstanding oxidation stability, superior resistance to rancidity, uniform viscosity, and low unsaponifiable content, added materially to the overall quality and aging properties of his products. And since Emersol 211 costs no more than competitive grades, all these sales advantages were realized at no extra cost.



how Emersol 132 Lily gave lighter-colored esters for cosmetics and toiletries

Case History No. 12-47 . . . Because of the higher purity associated with lighter-colored products, this well-known manufacturer of esters was approached for lighter-colored monostearates for use in cosmetics, toiletries, and similar type products. Since esters are exposed to high temperatures during manufacturing, this producer's logical approach was to investigate the color stability of his ingredients. On checking various stearic acids, he found that the outstanding color stability of Emersol 132 Lily gave him exceptionally light-colored monostearates, far better than those from all others tested. And since Emersol 132 costs no more than competitive triple-pressed grades, this extra "sales-appeal" cost him nothing.

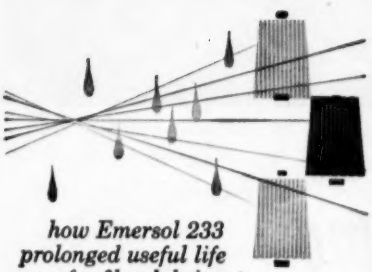
OUTSTANDING PERMANENCE

...from PLASTOLEIN 9720, the lowest-cost polymeric plasticizer available

In giving unusual permanence to plastics, you will find that Emery Plastolein 9720 will help make a name for your sheeting and coated fabrics. It has proven its superiority by imparting the kind of outstanding durability and weather-ability demanded by fabricators of finished plastic products.

Glance at the illustrated charts, and note its extremely low volatility, excellent resistance to mineral oil and gasoline extraction, superior heat stability. Equally important, Plastolein 9720 is the lowest cost polymeric type plasticizer available.

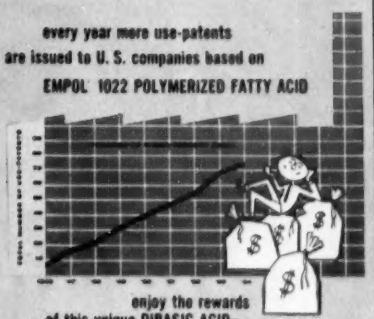
Furthermore, its lower-than-usual viscosity facilitates handling and permits bulk handling of tank car quantities.



how Emersol 233 prolonged useful life of a fiber lubricant

Case History No. 12-23 . . . A well-known manufacturer of rayon coning oils in which a double-distilled oleic acid was a major ingredient, became aware of the need for a more stable oleic acid because of more rigid aging requirements. This was due to a greatly increased time lapse between the times of manufacturing the oil and of its removal from yarns prior to dyeing. Knowing of our claims for Emersol 233 LL Elaine, he substituted it for the double-distilled grade in his formulation. Prolonged aging tests proved that Emersol 233 LL Elaine increased substantially the resistance of his coning oil to rancidity and yellowing and gave him maximum assurance against product failure . . . even after an abnormally long aging period.

every year more use-patents are issued to U. S. companies based on EMPOL 1022 POLYMERIZED FATTY ACID



enjoy the rewards of this unique DIBASIC ACID— investigate it today!

There is no more dramatic proof of the versatility of this unsaturated, high molecular weight, dibasic acid than the number of use-patents which have been issued to U. S. companies. These aggressive firms, in the last seven years, have exploited Empol 1022 with profitable vigor. The result has been a host of new uses for polyesters, polyamides, esters, amides, soaps, and other derivatives in such fields as adhesives, coatings, petroleum, surfactants, resins, and rubbers.

But, the discovery of all these uses for Empol 1022 Polymerized Fatty Acid has by no means exhausted the possibilities. Its unique combination of high viscosity, excellent heat stability, dibasic structure, and relatively high molecular weight (C36) still offers unlimited opportunities to alert research organizations. Why don't you investigate Empol 1022 and see how it can be transformed into profitable end-products?

LOW TEMPERATURE FLEXIBILITY

SPECIFY PLASTOLEINS® 9058 DOZ AND 9057 DIOZ

Balmoss and their low-temperature problems aside—what about yours! Fabricators of plastic items will be more receptive to your vinyl products if you can offer them superior low-temperature flexibility . . . like that provided by Plastoleins DOZ and DIOZ.

In addition, these Emery Plasticizers give many other advantages to calendered and cast films, calendered sheeting, calendered and dispersion coated fabrics, and extruded products. They provide low volatility, low water extraction, excellent heat and light stability, high plasticizing efficiency and extremely low soapy-water extraction.

Find out how you can make your products more attractive sales-wise. Today, write to Dept. 60 for descriptive literature and samples of Plastolein 9058 (di-2-ethylhexyl azelate) or Plastolein 9057 DIOZ (di-iso-octyl azelate).

Emersol® 132 Lily withstood 2 years Storage with no ill-effects

Case History No. 2-51: A medium sized manufacturer of high-quality esters uncovered a number of bags of Emersol 132 Lily that somehow had escaped inventory rotation. Although the appearance and odor of the material was normal, he sent samples to us for assurance that it still met our high quality standards since his records indicated receipt 2 years ago. Our test results indicated that the Emersol 132 Lily was practically as good as the day it was made.

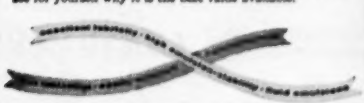
STOP STATIC PROBLEMS with TWITCHELL 7421 OIL

controls static on modern blends and high-speed machinery!

Improve your quality and increase production yet hold down costs with this superior fiber lubricant.

You'll find that Twitchell 7421 Oil will control static build-up regardless of machinery or fibers used . . . yet this modern fiber lubricant is in the medium price range and possesses all other requisites of a modern fiber lubricant.

Since actual performance tells our story better than words, we urge you to try Twitchell 7421 in your plant . . . to see for yourself why it is the best value available.



Emery

Emery Industries, Inc.,
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SEE OUR EXHIBIT • *Philadelphia, Dec. 5 to 9, 1955* EXPOSITION of CHEMICAL INDUSTRIES

AUTOMATION ...at Home in Outstate Michigan

✳ *Consumers Power Company itself has automatized inspection and reconditioning of electric and gas meters for its 64-county Outstate Michigan service area in this new plant near Jackson. In a single year more than 220,000 electric meters and more than 80,000 gas meters will go through scientific inspection and repair cycles here.*

AUTOMATION means more mechanization . . . greater production from the same number of workers . . . more goods to raise the American standard of living.

It also means that workers must be more highly skilled . . . people with the knack of working with machinery and keeping it in smooth operation.

Outstate Michigan has those people. Here mechanized production is a familiar story.

Automation may also mean more small plants, distributed over a wider area.

And workers will want to live in good communities with pleasant surroundings.

Outstate Michigan has hundreds of good communities in the midst of one of America's great scenic and resort areas. It's an area that fits industry . . . including automated industry . . . like a glove.

It takes a specific location with proper facilities TO FIT YOUR NEEDS. Write us YOUR REQUIREMENTS.

Get the Facts, Mr. Industrialist, and you'll agree . . .

OUTSTATE MICHIGAN IS THE PLACE TO GO PLACES!

FOR INFORMATION CONTACT INDUSTRIAL DEVELOPMENT DEPT. **CONSUMERS POWER COMPANY**
JACKSON, MICHIGAN

The National Merit Scholarship Corporation

Business is Offered Big Dividends on Investment in Higher Education

The McGraw-Hill Publishing Company is availing itself of the opportunity to establish ten National Merit Scholarships. They will be known as the McGraw-Hill Merit Scholarships. The scholarships are to be awarded to qualified candidates for a four-year college course in the fields of science, engineering and the other professions and the liberal arts. There will be no limitation, beyond the appropriate professional accrediting, on the college or university selected by a successful candidate. As part of a continuing program to aid higher education and educational institutions, McGraw-Hill is happy to be able to share in what it believes to be the constructive educational endeavor of the National Merit Scholarship Corporation.

Business firms searching for a satisfactory avenue to provide financial aid for our colleges and universities now have a new opportunity of major importance. It is provided by the National Merit Scholarship Corporation, which has offered to devote $8 million to matching, dollar for dollar, gifts by business firms for college scholarships and supplemental gifts to the institutions where the scholarships are used.

The National Merit Scholarship Corporation, an independent agency financed initially by gifts of $20 million from the Ford Foundation and $500,000 from the Carnegie Corporation, has three major purposes which are closely related. They are:

1. To locate those of the nation's young men and young women who are best equipped to go to college.

2. When necessary, to help these young people go to college by giving them financial aid.

3. To help colleges and universities meet the full cost of the instruction of those to whom National Merit scholarships are granted.

At present about half of the nation's top high school graduates do not go to college. The principal reason is that they do not have the money required.

To Save Unused Brain Power

The National Merit Scholarship Corporation will strive to eliminate this dangerous neglect of top-flight ability. To this end it is inviting the nation's high schools, numbering more than 24,000, to participate in its program by designating as available candidates for National Merit scholarships the top 5 percent of their senior classes. Those so designated are then invited to take a series of tests and to submit reports designed to assure selection of the very best talent in each state. The number of scholarships to be allotted to each state will be proportionate to the number of high school graduates in the state.

The winners, the total number of whom will be determined by the amount of money the Scholarship Corporation has available, will be eligible for awards. For those who need no financial help to go to college there will be honorary awards of $100. For those who must have help the Corporation will grant scholarships covering as much as necessary

of the cost of instruction and living expenses for a four-year college course.

Colleges Get Financial Help

The provision of funds to cover the students' expenses does not, however, solve the financial problems faced by many colleges. That is because the tuition charges paid by the students do not cover the cost of the instruction. The deficit must be met by drawing upon endowment funds, gifts, grants, and other available sources.

Consequently, to prevent holders of National Merit scholarships from imposing any additional financial burden on the colleges and universities they elect to attend, the Corporation will make a supplementary grant to these institutions. The supplementary grant will be the equivalent of regular tuition charges made by the school, with a top limit of $1,500 a year for both the tuition and the supplement.

As the scholarship grants to the winning students will vary, depending upon how much financial help they need, so will the supplementary grants vary from one college to another, depending on their regular tuition charges. However, it is anticipated that on the average the full cost of a National Merit scholarship—including aid to the student and the supplement to the college—will be about $1,500 a year.

Many business firms will find a compelling appeal in a program which is designed at once to mobilize the nation's intellectual resources more effectively and, in the process, give very badly needed financial help to our colleges and universities.

Two For One Return Offered

However, there are numerous other inducements to business firms to finance National Merit scholarships. These scholarships may:

1. Carry the name of the firm or be named in honor of someone designated by the firm.

2. Be limited to use in types of colleges of particular interest to the sponsoring firm.

3. Be limited to a college course, such as science, engineering or liberal arts, of special concern to the sponsor.

4. Be restricted to candidates or institutions in geographic areas specified by the sponsor.

In addition to these advantages there is a special financial inducement to help the Merit Scholarship program. It is that for every Merit scholarship a firm or individual finances, the Corporation will, up to the limit of $8 million, match the funds and make another National Merit scholarship available.

There are many good ways of helping our financially beleaguered colleges and universities, and many corporations are already using one or more of them.* For those companies that can do so without embarrassing complications one of the best ways is to make unrestricted gifts directly to the institutions. But this new way provided by the creation of the National Merit Scholarship Corporation (Address: 1580 Sherman Avenue, Evanston, Illinois) has the broad appeal of serving two purposes of transcendent importance simultaneously. The purposes are to see that our best brains are fully trained and utilized and that our colleges and universities, crucial contributors to this process, are helped at the same time. Business will serve the nation and its own community well by giving the National Merit Scholarship Corporation generous help.

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* These, as well as the plight of our colleges and universities, are discussed in a pamphlet, "Business Aid to Our Colleges and Universities," which embodies a series of five editorials which appeared in all McGraw-Hill publications. Copies of the pamphlet can be obtained without charge by addressing the Department of Economics, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 36, New York.

Methods of helping our colleges and universities financially are also outlined and discussed in a pamphlet, "Aids to Corporate Support of Higher Education," which may be obtained without cost by addressing the Council for Financial Aid to Education, 6 East 45th Street, New York 17, New York.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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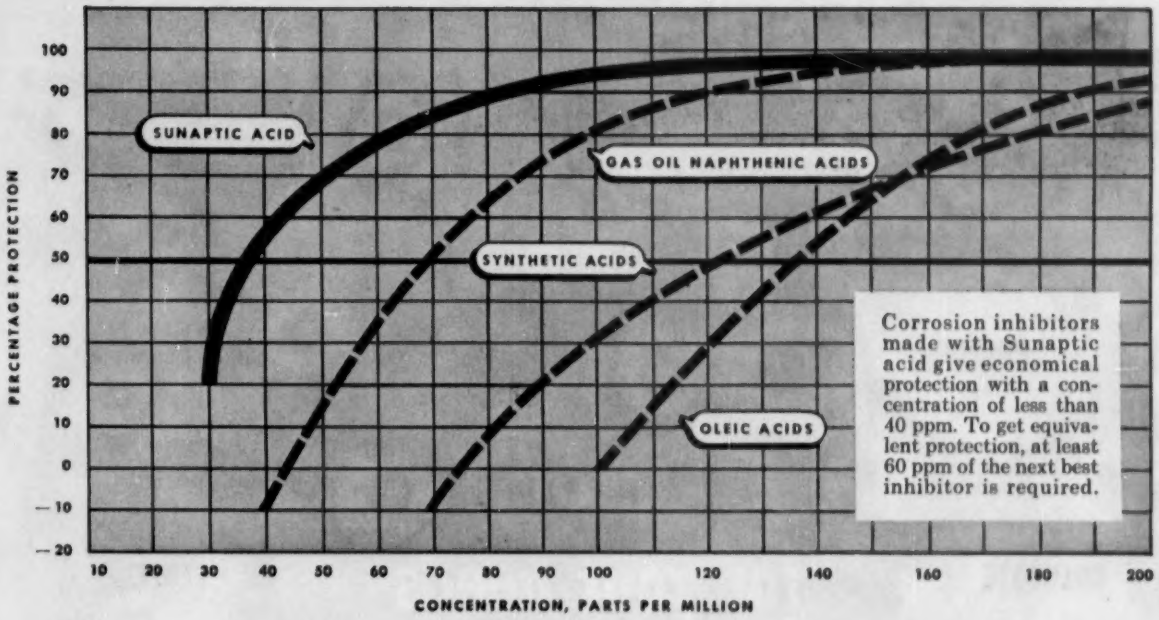
Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.



UNIQUE SUNOCO PETROCHEMICAL INCREASES EFFICIENCY OF CORROSION INHIBITOR OVER 50%

High-molecular-weight Sunaptic acids replace fatty, naphthenic and synthetic acids

Corrosion of tubing and casing in oil wells and in crude oil pipelines is a major problem that can be minimized by corrosion inhibitors. Several promising corrosion inhibitors combine tallow diamine with fatty, naphthenic or synthetic acids. The results of tests with these inhibitors were considered excellent until an inhibitor containing Sunaptic acid was tested. The Sunaptic acid inhibitor, which costs about the same per gallon, proved to be 50% more efficient than the next best inhibitor. This increased efficiency can save thousands of dollars a year in one oil field alone.

If you are making a product with fatty, rosin, synthetic, or ordinary naphthenic acids, there's a good chance Sunaptic acids can help you improve your product. These unique high-molecular-weight acids have many unusual properties: no olefinic unsaturation, high resistance to oxidative rancidity, low freezing or pour points, and a higher hydrocarbon solubility than ordinary fatty and rosin acids.

Sun Oil Company has two Technical Bulletins describing both the properties of Sunaptic acids and many possible uses for them. To get copies of these Bulletins, see your Sun representative, or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. CW-11.

Sun Oil Company produces many other petrochemicals. These include:

BENZENE, TOLUENE, MIXED XYLENES
PROPYLENE TRIMER AND TETRAMER
SULFONATE WS (water soluble sulfonates)
PDO-40 (polymerized drying oil)

The list of Sunoco Petrochemicals is growing rapidly . . . several new Sunoco Petrochemicals will be introduced shortly. If you have a problem that may be solved by a new type of petrochemical, we'll be glad to discuss it with you.

INDUSTRIAL PRODUCTS DEPARTMENT

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USS Chemicals

USS

UNITED STATES STEEL

TRUE'S HOME WORKSHOP PROJECTS

WEEKEND CRAFTSMAN: The frosting on the basic home-repair market.

Put Together, It Spells Cash

In the continuous effort to hold house and home together, American handymen (and unhandymen) spend about $15 million/year on small-packaged adhesives. Although household glues and cements have been first-class passengers on the basement-craftsmen boom, the industry still rests on a broad, solid foundation of broken pieces. The conviction of one maker: more sales are sparked by loose rungs on chairs than by anything else.

It is the repair-it-yourselfers who have been pushing the industry's traditional search for the all-purpose adhesive—a search most active at the hardware store level. Whereas the growing ranks of hobbyists tend to pride themselves on the number of different specialized glues and cements on the workshop shelf (encouraged by information sheets issued by makers), when the average homeowner buys a bottle of glue, he expects the glue to hold every situation for a while.

For this reason, many adhesive packages reserve considerable space for a list of substances that can be bonded. The fact remains, however, that although most adhesives will stick anything to some extent, the different types do have particular jobs for which they are best, are mediocre to poor for other tasks.

The principal types offered, their uses, and some leading brandnames are:

• Rubber cement, for paper, rubber, leather—Goodyear Rubber Cement (Goodyear Rubber Co., Akron, O.); Carter's Rubber Cement (Carter's Ink Co., Boston); Sanford's Rubber Cement (Sanford Ink Co., Bellwood, Ill.).

• Rubber-base cement, for light bonds on a variety of surfaces including glass, plastic, metal — Miracle Cement (Miracle Adhesives Corp., New York).

• Vegetable glue, for paper and cardboard—LePage's Mucilage (LePage's, Inc., Gloucester, Mass.); Carter's Paste, and Sanford's Library Paste.

• Synthetic cellulose resin glues, for glass, china, plastic, model making, light repair work—DuPont Duco Cement; Testor's Household Cement (Testor Chemical Co., Rockford, Ill.); LePage's Miracle Mender.

• Polyvinyl glues, for all but heaviest wood working (if water resistance isn't necessary), labeling, fabrics, bookbinding—Elmer's Glue All (The Borden Co., New York); Weldwood Presto-Set Glue (United States Plywood Corp., New York); Wilhold White Glue (Acorn Adhesives Co., Los Angeles); Ad Hero (Paisley Products, Inc., New York); LePage's Sure Grip; Fuller's All-Purpose Adhesive (H. B. Fuller Co., St. Paul, Minn.); Franklin's Evertite Glue (Franklin Glue Co., Columbus, O.).

• Casein glue, for furniture repair, cabinet making — Casco Powdered Casein Glue (The Borden Co.); LePage's Casein Glue.

• Urea-formaldehyde resin, for close-fitting wood joints — Cascamite (The Borden Co.); Weldwood Plastic Resin Glue; LePage's Plastic Resin Glue; Wilhold Speed Glue.

• Resorcinol-formaldehyde resin glue, for waterproof bonds on outdoor furniture, boat building, sports equipment — Elmer's Waterproof Glue; Wilhold Waterproof Glue; Weldwood Waterproof Glue.

• Animal or fish glue, for furniture and making or mending other wood products — LePage's Liquid Glue; Franklin Hide Glue; McCormick Iron Glue (McCormick & Co., Baltimore, Md.).

• Synthetic rubber adhesives, for immediately setting bonds between plastic laminate and wood, plywood and studs—Weldwood Contact Cement; Elmer's Contact Cement; Wilhold Contact Cement; LePage's Contact Cement.

• Noncontact synthetic rubber adhesives, for metal, wood plastic, fabric, rubber, wallboard—Pliobond (Goodyear Rubber Co.); Stabond (American Latex Products Corp., Hawthorne, Calif.).

• Flexible casein latex, for wood, paper, metal, glass, felt, fabric, leather, plastic, linoleum, especially where flexible bond is required — Casco's Flexible Cement.

• Pressure-sensitive adhesive, for coating paper so that it can be used like Scotch Tape—Wilhold Ree-Stik Cement.

LePage's produced the first small-packaged liquid glue in the 1880s when it learned how to give it shelf life (previously all glue had to be mixed as it was used), and first produced the still popular Liquid (fish) glue.

LePage's is still the sales leader —thanks largely to its wide line—in the over-all household adhesives market; its mucilage is the biggest selling small adhesives package.

Following LePage's in paper-stickers are Carter's, and Sanford's. The biggest selling wood bond is Weldwood

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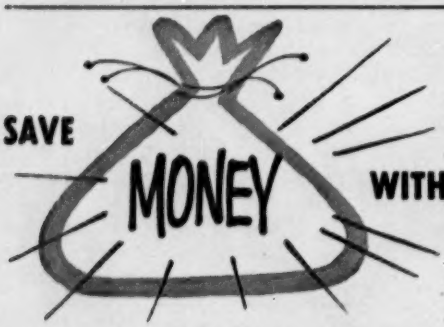

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CARBIDE's 2-methyl-5-ethyl pyridine is the lowest priced, pure pyridine-type compound available in large quantities. It's used as a solvent and acid acceptor for the manufacture of vat dyestuffs, and for the preparation of vitamins, pharmaceuticals and pyridine-type monomers. The unusual combination of strong basicity and low water solubility, suggests trial as an extraction solvent, resin curing agent, and intermediate for corrosion inhibitors.

CARBIDE's dependable raw material sources and expanded production facilities mean uninterrupted delivery and low cost for this synthetic chemical.

For information concerning applications, physical properties, and shipping data on 2-methyl-5-ethyl pyridine, please call or write your CARBIDE office and ask for F-7621B.

In Canada: *Carbide Chemicals Company*
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Carbide and Carbon Chemicals Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street New York 17, N. Y.

Plastic Resin. Smaller than the Weldwood line are Borden, McCormick, Franklin, Fuller. The synthetic cellulose types, led by Duco and Testor's, are also in the top ranks.*

Fish Substitute: The trend is definitely toward synthetics, away from fish and animal glues, which have odor problems, don't give as permanent a bond, have poor resistance to heat and humidity extremes.

The front-running replacements are the polyvinyl resins (white glues), the synthetic rubber contact cements, and the recent resorcinols. Of these, the polyvinyls, the strongest of the ready-mixed adhesives, are most popular among wood workers. The resorcinols, now available only in the Borden and Wilhold versions (Weldwood will have its product out in January), are extremely strong, quite resistant to heat, cold, water, mould and solvents, but require careful mixing by the user.

In developing new home adhesives, the important aims are to get strength, speed of setting, and ease of handling. Glue price is seldom a factor—the cost of packaging is generally the major part of the retail package price.

Packages have come into prominence during the past few years. Formerly found only in glass bottles, cans or metal tubes, adhesives are now blossoming out in new dress. One mucilage is in an aerosol—Bonad Spray Adhesive (Walsh Adhesive Corp., Montreal). The polyvinyls are most often offered in polyethylene squeeze bottles with applicator nozzles (some are in polyethylene tubes).

Glue and Glitter: As any hardware, paint or variety store operator can tell you, there are a lot of brands bidding for the $15-million adhesives prize, and new ones are coming in all the time. Keeping up with the pack, therefore, requires constant new thinking. New products are developed, glues are put into new packages, and some makers are even thinking up new uses.

Examples from Los Angeles's Acorn Adhesives Co. (Wilhold glues): dilute it with water and use it to stiffen curtains, apply it to doilies, table mats, wall paper, to make them easy to wipe clean. For this Christmas, Acorn is offering a combination decorating kit—a bottle of glue with a bottle of metallic glitter.

* One of the biggest, National Starch Products Corp. (New York) makes for private label.

Alkane
(Basic material in manufacture of surfactants)

Detergent Slurry

Detergent D-40

Detergent D-40SF

SURFACTANTS

Detergent D-40FG

Detergent D-60

Wetting Agent S

Dispersant NI-W

Dispersant NI-O

BY THE WORLD'S LARGEST PRODUCER OF SYNTHETIC DETERGENT RAW MATERIALS

Have a problem that requires a detergent? A wetting agent? An emulsifier? A foaming agent? Whether you require the basic raw material or a surfactant in intermediate form or a finished product—it will pay you to investigate the complete Oronite line.

Oronite surfactants are priced competitively and have the high quality and uniformity you expect from the world's largest producer of synthetic detergent raw materials.

Why not talk over your needs with an Oronite detergent specialist? Write or phone the Oronite office nearest you.

ALKANE

New! Alkane Technical Bulletin—available to those interested in processing finished detergents from the basic raw material.

ORONITE CHEMICAL COMPANY

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Advance Info

ADVAWAX 280

(N, N' — ethylenebis-stearamide)

Synthetic wax has many applications

- An Extender or Substitute for Carnauba Wax
  In mold-release compounds
  In Floor and car polishes
- Plastic Lubricant and Anti-blocking Agent
- Anti-tack Agent in Adhesives
- In Lacquers
- In Baked-on Insulating Varnishes
- In Electricals
- In Drawing Compounds
- In Textile Waterproofing

If you'd like complete data on ADVAWAX 280, or would like a sample to work with, write to

ADVANCE
SOLVENTS & CHEMICAL CORP.
245 Fifth Avenue • New York 16, N.Y.

P-B's LEONARD: Cause and cure for carbon paper smudge.

White Collar Sprays

A lot of people can see the broad markets, but it takes a trained eye to see many of the needs lurking among narrow, specialized situations. For example, it took a maker of carbon paper to see specialties possibilities in the need for a product to clean carbon-paper-smudged hands. Seeing this and similar needs led Panama-Beaver, Inc. (Chicago) into the aerosol specialties business.

Sixty years a maker of carbon paper, inked ribbons, and duplicating supplies, P-B has learned a lot about what is needed by modern office workers and, perhaps more important, how to sell it to them. For example, realizing that the working girl is the vital contact, the firm will soon be packaging cologne for give-aways.

Working Girls' Friend: Profit bringers, not give-aways, are the members of the new aerosol line, but they are also designed to appeal to the girls (company salesmen say they help to sell the whole 40-item line). So far P-B has five products in spray cans:

- Spra-Clean, a solvent (not carbon tetrachloride) cleaner for manual typewriters, tabulating machines, adding machines, marking machines and addressing plates.
- Electra-Clean, a cleaner with a quicker-evaporating and harder-cleaning solvent for electric office machines.
- Du-Clean, a hand cleaner to remove ink, grime, and grease stains received while handling office equipment and supplies.
- Static-Ban, to eliminate the static electricity that annoys operators of duplication, photo-offset, blueprint, folding and card-punching machines.
- Air-Sweep, a spray room deodorizer.

As are other P-B products, the new aerosols are sold by office-to-office salesmen. For the new line, the salesmen went through training classes (once a week for 4-8 weeks) where they learned to demonstrate the products. "Nothing," declares P-B President C. J. Leonard, "can equal the power and weight of a competent man who can successfully demonstrate a product."

Leonard himself (the only honorary male member of the National Secretaries Assn.) thought up the new products after seeing office girls' irritation at such things as harsh chemicals and abrasives (which removed nail polish along with office grime) and the rags and brushes needed to clean typewriter keys.

Lured Away: More ideas are coming. Two now approaching production: an aerosol cleanser for removing ball-point and stamp pad ink; a fountain brush filled with mimeograph correction fluid. Others are brewing—some, the company says, may be aerosol products completely outside the office field.

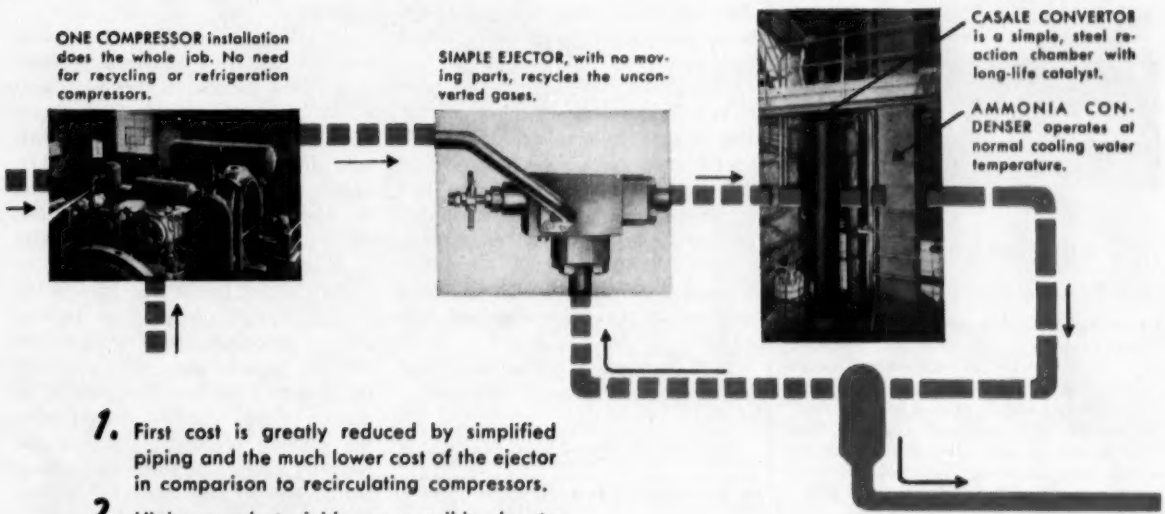
six reasons why

HIGHER PRESSURE

means

LOWER COST

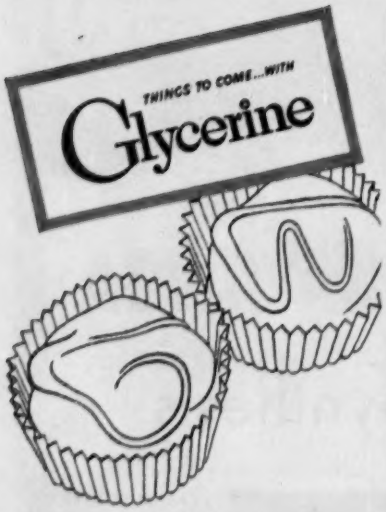
in Casale Ammonia Synthesis


ONE COMPRESSOR installation does the whole job. No need for recycling or refrigeration compressors.
SIMPLE EJECTOR, with no moving parts, recycles the unconverted gases.
CASALE CONVERTOR is a simple, steel reaction chamber with long-life catalyst.
AMMONIA CONDENSER operates at normal cooling water temperature.

1. First cost is greatly reduced by simplified piping and the much lower cost of the ejector in comparison to recirculating compressors.
2. Higher product yields are possible due to minimizing of the leakage which cannot be avoided when using recirculating compressors.
3. Oil contamination into the passing gases is eliminated. This condition is an inherent disadvantage of mechanical compression systems.
4. A simplified heat exchanger built into the reaction chamber eliminates outside heat exchanger and simplifies piping.
5. High operating pressure permits production of liquid anhydrous ammonia at normal cooling water temperature.
6. High operating pressure also provides greater reaction tolerance for carbon monoxide and oxygen contaminants in the synthesis gas.

THE CASALE process has been proved in more than 40 synthesis plants with a combined capacity of over 5,000 tons per day. In all cases, the operating pressure of 9,000 to 12,000 psig has been a definite economic advantage — contributing to greater economy of installation and operation and maximum yields of pure, liquid anhydrous ammonia. Our long experience in this field is at your service. Write for Bulletin No. 0-54-1. *Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.*

FOSTER WHEELER



TASTY CREAM CANDIES

. . . with longer shelf life

Candy makers have a problem when cream fillings develop disagreeable taste and odor after a few weeks on store shelves. They've looked long and hard for a way to eliminate this spoilage which is caused by the formation of free fatty acids. Researchers have tried to stop or slow down the reaction by adding chemical retardants. But taste and texture could not be sacrificed.

Tests have shown that in some cases addition of 1-2% Glycerine almost doubles shelf life, promising a more trouble-free future for the candy industry.

The unique balance of properties that won such wide acceptance for Glycerine in the candy industry in the past continues to open new doors to progress. In paints, foods, pharmaceuticals, packaging . . . for tomorrow's surge of new specialties . . . in formulations and reactions yet unknown, nothing takes the place of Glycerine.

For your free copy of a 16-page booklet on Glycerine properties and applications, write to — GLYCERINE PRODUCERS' ASSOCIATION • 295 Madison Avenue, New York 17, New York.

This tempting group of properties

HYGROSCOPICITY • STABILITY • SOLVENT POWER • VISCOSITY • NONVOLATILITY • NONTOXICITY • TASTE • MW/HYDROXYL RATIO •

keeps Glycerine's

HUMECTANT • CARRIER • SOLVENT • LUBRICANT • SOFTENER • EMOLLIENT • ANTI-FREEZE • ALKYD BASE •

Capsule Cure for Soil Ills

Outside of the daily vitamin pill washed down with the breakfast orange juice, the average specialties maker is seldom likely to regard the gelatin capsule as essential to his welfare. But Wallace Kay, president of Chemical Research, Inc. (Detroit), firmly backs the capsules as virtually creating one phase of his company's business.

The case in point: Fumi-Soil, a small capsule of ethylene dibromide, which by last week had gone far over the 15-million-unit mark in sales. And the easy-to-use capsules have undoubtedly done much to introduce the home gardener to the benefits of soil fumigants.*

The green, pea-size capsules have been sold not only in the U.S., but also in such far-away spots as Thailand, New Zealand, Cuba, Puerto Rico, Alaska, Egypt, Ethiopia, and the Philippines. But despite the broad distribution and vast number of units, Fumi-Soil is still definitely a specialty —about 2,000 gal. of EDB has been required for the entire output of capsules.

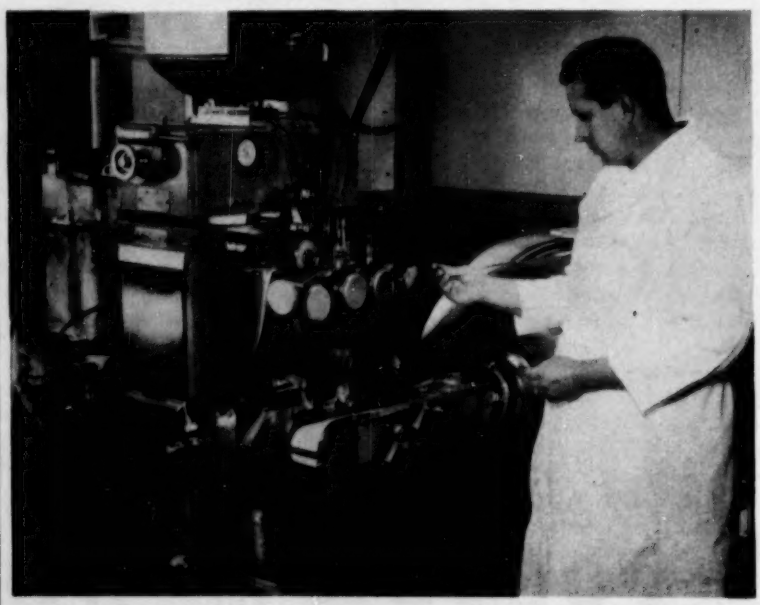
In a Nutshell: It is the small size of the pellets, however, that makes them useful to gardeners. Each one, holding 0.5 cc. of the pure dibromide, will kill the wireworms, grubs, beetles, etc., in a cube of soil 15 in. on a side—or wipe out an anthill, for example. Generally, boxes of 200 Fumi-Soil pellets are retailed (at $4.50) to gardeners.

(Commercial growers usually employ the dibromide in a naphtha carrier, apply it at a 2-4-gal./acre rate. Dow, which supplies Chemical Research, sells ethylene dibromide formulations under the tradename Dowfume.)

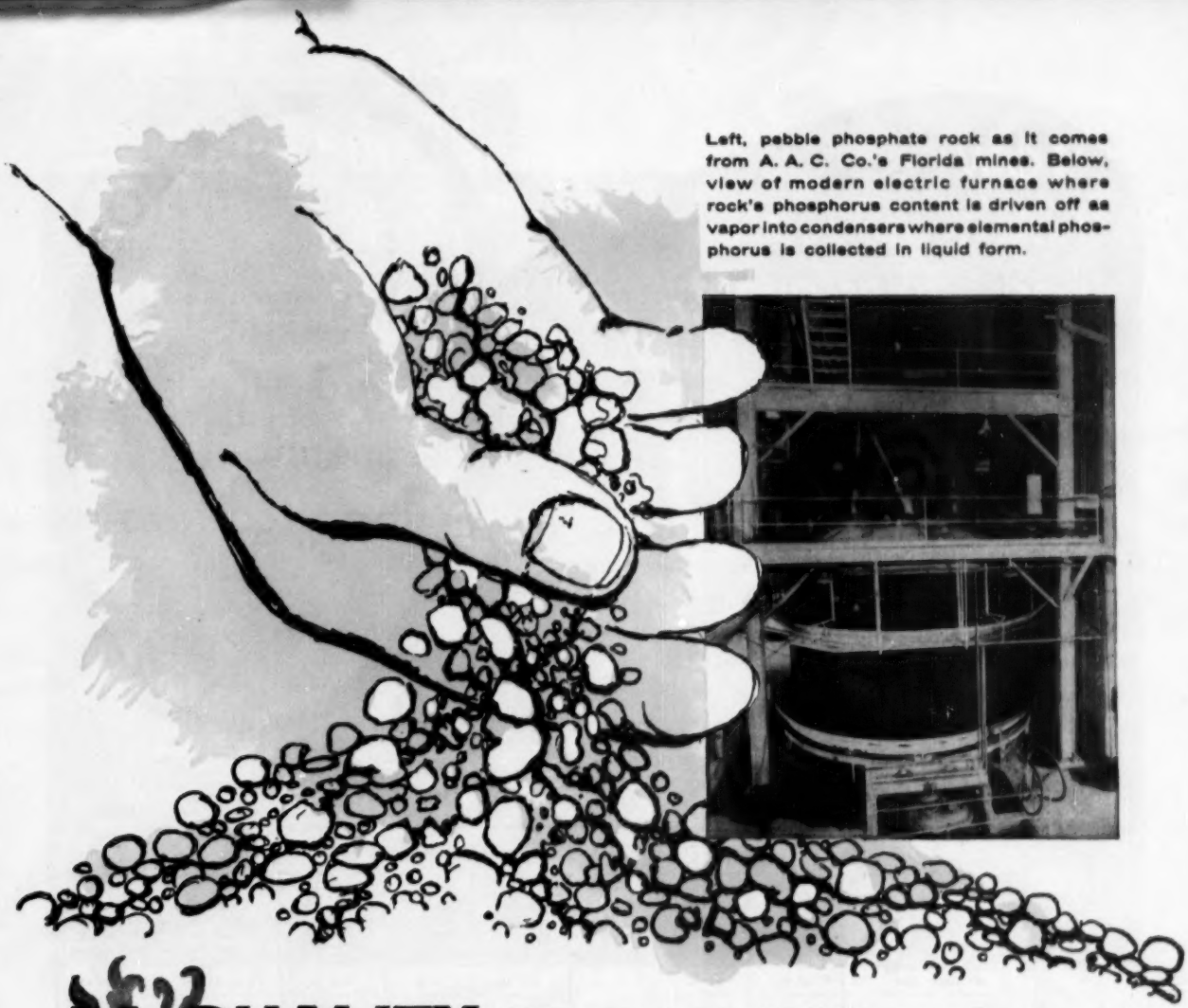
CR's Kay developed the fumigating capsules to solve a wireworm problem in his own garden. A chemist turned banker, he credits *The Reader's Digest* for clues that led to his putting ethylene dibromide in a gelatin jacket. (Methyl bromide and chloropicrin were ruled out as being too expensive, more unpleasantly odorous, trickier to handle.)

No Carrier: But at that time—1946 —EDB was sold only in the naphtha carrier. It took plenty of work to devise the capsule, get USDA approval of the pure EDB as a fumigant. R. F. Scherer Corp. (Detroit) helped solve the packing problems, designed the rapid-fill equipment that can produce half a million capsules in a 24-hour

* Fumi-Soil was recently contained in "Things of Science," the instructive kits on science subjects distributed by Science Service. Destroying an unwanted anthill was the suggested "experiment."



CAPSULE MAKING: Gelatin capsules are machine-formed, -chilled, -filled.



Left, pebble phosphate rock as it comes from A. A. C. Co.'s Florida mines. Below, view of modern electric furnace where rock's phosphorus content is driven off as vapor into condensers where elemental phosphorus is collected in liquid form.

AA QUALITY Elemental Phosphorus

99.9% pure... Electro-Thermally produced

Elemental Phosphorus cake

Whether used in its 99.9% pure elemental form or in the ever-widening range of phosphorus derivatives and compounds, AA QUALITY Elemental Phosphorus assures highest standards of quality and uniformity. *Quality* you can rely on, because of rigid control from mines to finished products. *Service* you can depend on, because of large-scale production and ample phosphate-rock reserves. Assured quality, security of supply, prompt service—sound reasons for using AA QUALITY Chemicals. Write for further information and samples.

"From our mines to your plant"

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

Chemical Division: 50 Church Street, New York 7, N. Y. • 30 plants and offices serving U. S., Canada, Cuba

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Phosphorus Red (Amorphous)
Phosphorus Pentasulphide • Sesquisulphide
Ferro Phosphorus (Iron Phosphide)

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85% N. F. Grade • 75% Pure Food Grade
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All grades Florida Pebble Phosphate Rock
Superphosphate
Complete Fertilizers

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Potassium Fluosilicate
Sodium Fluosilicate • Zinc Fluosilicate
Fluosilicate Mixture
Ammonium Fluoborate
Aluminum Fluoride
Magnesium Fluoride

GELATIN
KEYSTONE® Gelatin: Edible, Photographic, Pharmaceutical, Technical

OTHER PRODUCTS
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NOW! larger production and higher quality MAGNESIA COMPOUNDS

for industrial and chemical applications

NEW PLANT FACILITIES provide industry with more types and volume of magnesia compounds . . . used as fillers, extenders . . . for conditioning, chemical or physical agents . . . and for many other purposes in a wide range of products. Continuing twenty years of high-quality chemical production from superlative Michigan natural brines, Michigan Chemical Corporation can now supply your added requirements for the best in magnesia compounds . . . whether your business is textiles, rubber, chemicals, refractories, insulation, ceramics or fertilizer blending.

TYPICAL ANALYSES OF MICHIGAN MAGNESIA COMPOUNDS

	No. 1 Calcined Magnesite	No. 5 Calcined Magnesite	No. 15 Calcined Magnesite	No. 30C Light Calcined Magnesia	No. 40 Extra Lt. Calcined Magnesia	Basic Magnesium Carbonate	(NF Grade) Magnesium Hydroxide	(Tech. Grade) Magnesium Hydroxide
Bulk density, weight per cubic foot	60 lb.	28 lb.	24 lb.	8½ lb.	5 lb.	5.5 lb.	15 to 25 lb.	app. 20 lb.
Ignition loss:	0.5%	1.5%	2.5%	1.9%	3.0%	56.5%	PASSES N. F. IX SPECIFICATIONS	31.4%
Chloride (as CL):	0.08	0.1	0.2	0.25	0.25	0.1		
Analysis, ignited basis:						NOT IGNITED		NOT IGNITED
SiO_2	0.3	0.3	0.3	0.3	0.3	0.15		0.20
Fe_2O_3	0.2	0.2	0.2	0.2	0.2	0.08		0.15
Al_2O_3	0.2	0.2	0.2	0.2	0.2	0.08		0.15
CaO	1.0	1.0	1.0	1.0	1.0	0.7		0.7
Mn				0.01	0.01	0.00		
Free Moisture						1.5		2.0
Screen test: Through 200 mesh		95%		99.9%	99.9%	99.99%	99.0%	99.0%
Screen test: Through 325 mesh			99.5%	99.5%	99.5%	99.5%		

MC **

Write for the Michigan Chemical Catalog containing technical data and specifications on magnesia compounds as well as information on other Michigan Chemical products.

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M55-1

MICHIGAN CHEMICAL CORPORATION
503 Bankson Street, Saint Louis, Michigan
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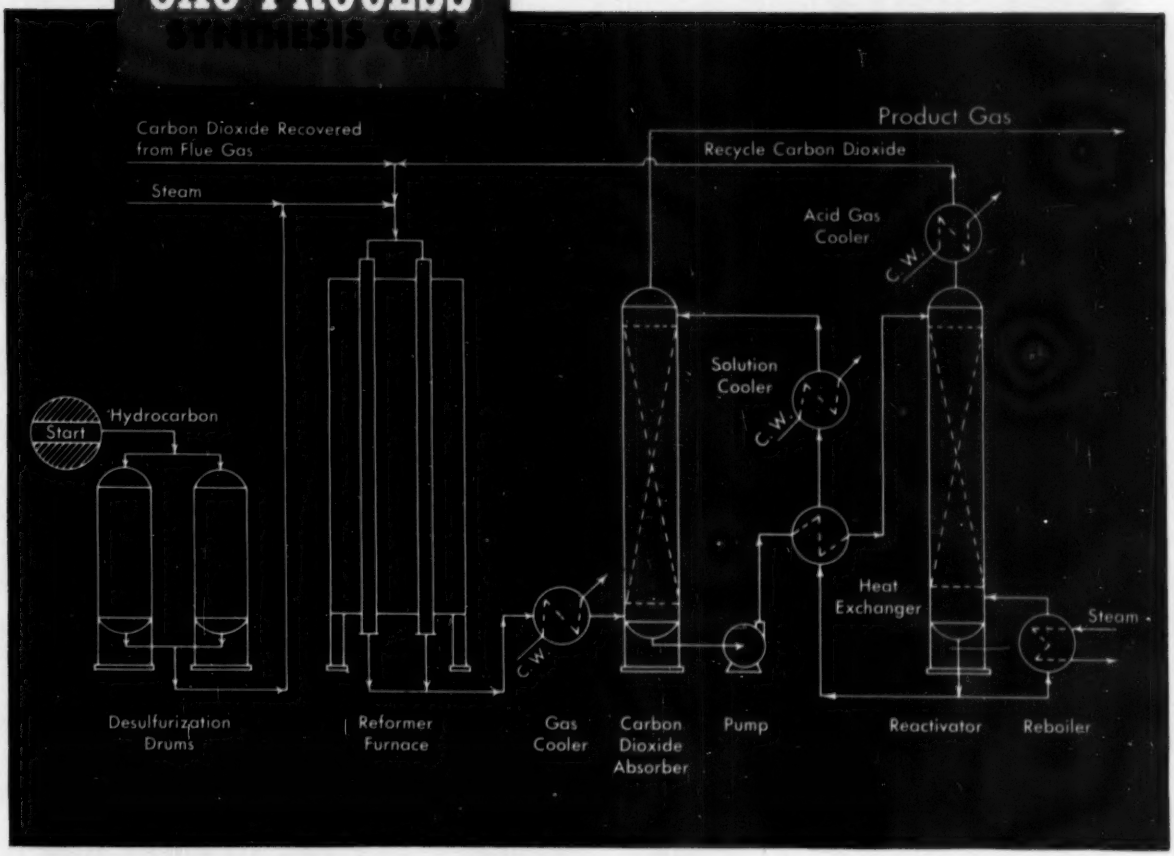
QUALITY PRODUCER OF PESTMASTER* DDT AND METHYL BROMIDE AND OTHER AGRICULTURAL CHEMICALS

OXO PROCESS
SYNTHESIS GAS



GIRDLER hydrogen-carbon monoxide plants give wide range of mixtures

THE FLOW CHART shows the design of a plant for producing synthesis gas for the "Oxo Process" used in the production of aldehydes and high molecular weight alcohols. A wide range of compositions is obtainable with Girdler synthesis gas plants . . . the ratio of hydrogen to carbon monoxide can vary from 4:1 to 1:9, to suit your requirements.

Girdler assumes complete responsibility for all phases of design, engineering and construction of these plants. Why not take advantage of Girdler's experience for *your* processing facilities. Call the nearest Girdler office.

GIRDLER DESIGNS processes and plants

GIRDLER BUILDS processing plants

GIRDLER MANUFACTURES processing apparatus

GAS PROCESSES DIVISION:

Chemical Processing Plants	Nitric Acid Plants
Hydrogen Production Plants	Acetylene Plants
Hydrogen Cyanide Plants	Sulphur Plants
Synthesis Gas Plants	Ammonia Plants
Carbon Dioxide Plants	Ammonium Nitrate Plants
Gas Purification Plants	Hydrogen Chloride Plants
Plastics Materials Plants	Fertilizer Plants
Formaldehyde Plants	Hydrogen Sulfide Plants

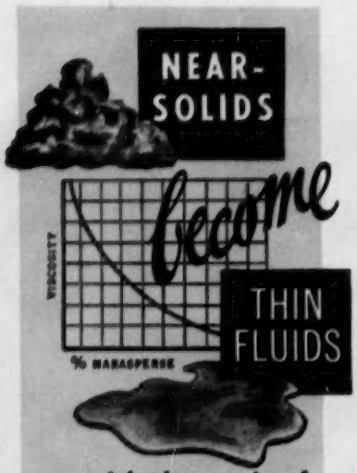
Catalysts and Activated Carbon

The GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

LOUISVILLE 1, KENTUCKY

GAS PROCESSES DIVISION: New York, San Francisco.
In Canada: Girdler Corporation of Canada Limited, Toronto



...with the magic of

MARASPERSE DISPERSANTS!

Magic? Well, perhaps not. Technically, a dispersant might be defined as a chemical product which prevents the flocculation of insoluble solids in a liquid medium.

IN THEORY

It's a matter of electrokinetics enabling the dispersing agent to maintain solids in a state of extreme subdivision.

IN PRACTICE

It means that the addition of a minute amount of dispersant (with efficient mechanical mixing) to a solids-in-liquid system, will let you fluidize thick slurries . . . or raise the concentration of solids possible in a liquid suspension . . . or prevent agglomeration of solid particles during wet grinding operations.

The Marasperse dispersants will do all of these things and more. Besides dispersing solids in water, they'll also stabilize oil-in-water emulsions. Furthermore, dispersions and emulsions can be made in hard or soft waters with the Marasperses. They perform well in the presence of electrolytes and can be used under both acid and alkaline pH conditions.

If you need a dispersant or emulsion stabilizer in your products or processes, evaluate the Marasperses. Use the coupon below to obtain further technical information.

MARATHON *Corporation*
CHEMICAL SALES DEPARTMENT
ROTHSCHILD WISCONSIN

Send information on Marasperse Dispersants File No. W-150, to:
NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

workday. The product was patented in 1951, years after application had been made. It has not, so far, been extensively advertised, nor given a broad publicity push.

As now marketed (and available since 1949), the capsules are strong enough to withstand, without rupturing, the weight of a man. Yet, in soil, they will break in about half an hour, releasing the EDB. The capsules can be mailed or shipped overseas, without special permits.

Chemical Research, which employs some 50 people on various projects, no longer makes or produces Fumi-Soil, itself. Scherer does the encapsulating, and recently Sherman Laboratories (Chicago) has taken over selling the pellets. It has a new use to boost sales of Fumi-Soil: capsules scented with pine oil can be used to deodorize garbage pails—and the EDB keeps marauding animals away.

Matter of Taste

Three stories high, stainless steel, and operated on electrically heated air, a new spray tower for drying flavors is now in operation at Norda's Boonton, N. J., plant.

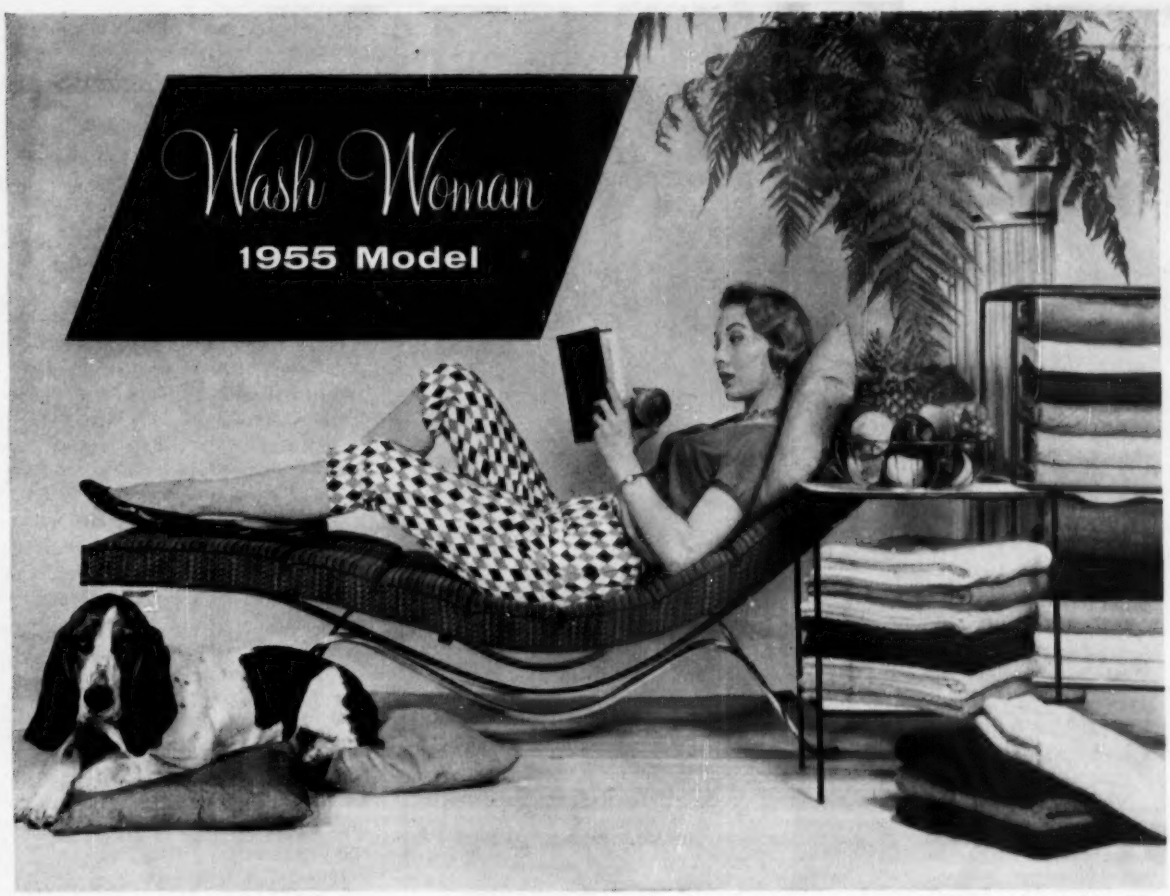
It's claimed to be the largest unit for this purpose in the world, capable of turning out 375 lbs. of the flavors each hour. And Norda says its spray-dried flavor particles are colloid-protected by a special process—they lose none of their values over an extended period of time (up to several years, in the case of fruit flavors).

Demand for dried flavors has boomed in recent years, with the increasing production of food mixes—cakes, pies, etc. Makers of these mixes originally employed flavors that had been dried onto the surface of starch powders. Later, the change was made to spray-dried material,

New Glue for Hard Grind

VALVE GRINDING WHEELS are one of the newest outlets for epoxy adhesives. Used to join aluminum inserts to the vitreous wheel (*assembly operation above*), the epoxies show several advantages over previously used resinoid bonding agents: epoxies have greater weld strength; they don't produce warpage on the insert.

Armstrong Products Co. (Warsaw, Ind.) produces the two-part glue (base plus activator) from Shell's Epons; Sterling Grinding Wheel Co. (Tiffin, O.) has developed the bonding techniques.



Lounge by Herman Miller

. . . and how Victor helped make this possible

It's washday, but the lady above has time for leisure . . . thanks to the new detergents that contain soil-chasing tripolyphosphate. Virtually *all* leading detergent manufacturers specify Victor tripolyphosphate. That's because Victor "Tripoly" helps detergents remove up to 41% more dirt.

Can the addition of a phosphate improve your product or process?

Helping produce better detergents and soaps is only one of the many applications of Victor Chemicals. Victor serves more than 40 other industries with phosphates, formates and oxalates to improve processes and reduce costs.

Send for the Victafile that tells about the Victor Chemicals that are being profitably used in your industry.

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Dependable Name in Chemicals
for 57 Years

VICTOR CHEMICAL WORKS CW 1126
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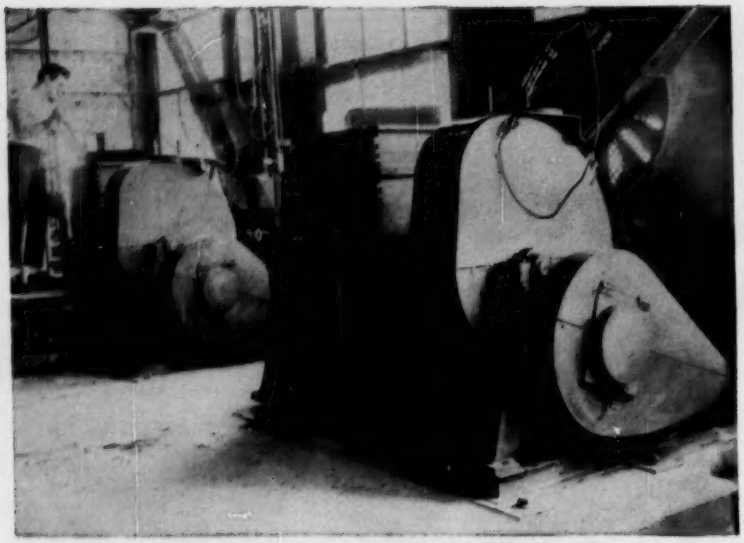
Please send Victafile showing uses of Victor chemicals in my industry.

*Firm Name*_____
*Address*_____
*City*_____ *State*_____
*Your Name*_____
*Industry*_____

(Please attach to your letterhead)



"it's three ways better at B. F. Goodrich"

#1 *It's faster* . . . delivers more production per hour.

#2 *It's efficient* . . . assures thorough dispersion of quality rubber doughs and cements.

#3 *It's safe* . . . special CO_2 seal on stuffing boxes (only 4 to 10 lbs. pressure) permits elimination of air from mix while protecting product from contamination by lubricants.

DAY IMPERIAL MIXER . . . built for heavy duty, engineered for precision, it incorporates many advanced engineering features to assure you high production at low cost. For complete details write for Bulletin 600.

FOUNDED 1887

in mixing equipment **DAY** *means longer life span*

THE J. H. DAY COMPANY
INCORPORATED
4932 BEECH ST., NORWOOD, CINCINNATI 12, OHIO
Division of Cleveland Automatic Machine Company

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
Western Canada: British Canadian Importers, Vancouver, British Columbia
Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5—D.F.

which offered greater storage life.

Norda admits to one difficulty in using its shiny new equipment: before a switch to a new flavor can be made, two and a half days of cleanup time are required.

Red, Bright and New

Facing up to the shortage of cadmium selenide reds, a recent plague to paintmakers, the Pigment Color Division of Imperial Paper and Color Corp. (Glens Falls, N.Y.) has developed a replacement. Basic patents are now pending on its new Mercadium reds.

The new pigment is a combination of the readily available sulfides of cadmium and mercury. The replacement is better than the original, claims Imperial, citing these advantages:

- Somewhat greater economy.
- Equal performance.
- Improved brilliancy.
- Cleaner hues.

Completely inorganic and calcinated at high temperature, Mercadium reds are insoluble in the media, resistant to high temperatures, quite fast to alkali and exposure.

Imperial is now producing a light and a dark red, is planning a total of six, including maroon and intermediate shades.

•

Sanitary Expansion: Puritan Chemical Co. (Atalanta, Ga.) will receive 65,000 additional square feet of manufacturing and storage facilities as a result of a new $500,000 expansion program. The firm manufactures sanitary chemicals for distribution to industrial and institutional markets in Southern, Midwestern and Middle Atlantic states.

•

Odor-Quelling Chemicals: Odors of the mouth and breath are the target of OraMist, polyethylene-tubed spray made by Dermetics (New York). Featuring an ingredient "derived from the buds of redwood trees," the pocket-size container sells for 98¢; it contains, the company says, 800 sprays.

• A new underarm deodorant—5-Day Stick Deodorant (5-Day Laboratories, Division of Associated Products, New York)—contains silicone. The silicone, says the firm, repels moisture, keeping the deodorant from washing away. Other ingredients: hexachlorophene (to destroy bacteria),

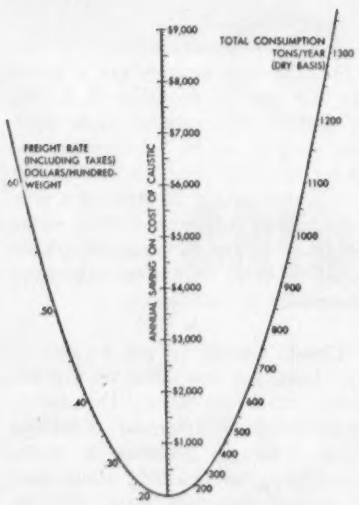
BRIEFS

for buyers of

Caustic Soda
Paradichlorobenzene
Muriatic Acid

50% to 73% — some save, some don't

Like to settle once and for all whether you can save by switching from 50% to 73% liquid caustic soda? Simply draw a line on this nomograph.



Start at your freight rate and draw to your annual consumption in tons, dry basis. Your approximate savings on freight will appear where you intersect the center line.

From this figure, subtract annual depreciation for dilution equipment. (We'll be glad to advise you on cost of this equipment.)

If you still show a saving, it would be wise to consider the big switch seriously.

For more facts on the economics of 50% and 73% caustic, check the coupon for a copy of our pocket-size *Caustic Soda Buyer's Guide*. And for specific technical advice centered on *your* requirements, just phone or write the nearest Hooker sales office.

The great moth hunt

Some of our forward-looking customers are busily getting set for those spring days when the housewives of the country decide to put away their woolens and furs until next winter.

To satisfy that market, you can offer a product unsurpassed in whiteness and dryness. That product is PARADI®.

We're almost unbelievably fussy about paradichlorobenzene. We make it in *seven* different sizes. Each size has its advantages, which you can learn by reading our Bulletin 454.

We manage to get PARADI so pure that it sublimes completely in use—leaving no residue, not even an odor!

This persistence seems to pay off. Users, who frequently sample the field, tell us PARADI is tops for repackaging, and the sparkling crystals make a firm, dry, non-oozing block or pellet of exceptional whiteness and brilliance.

If *you're* preparing to wage commercial war on moths, why not look into the convenience of PARADI'S seven sizes?

To get Bulletin 454, check the coupon. For 1-lb. samples of PARADI, write us on your business letterhead.

How to arrive at a happy HCl solution

For help in figuring your muriatic acid needs, send the coupon for our technical data sheet on this product.

It tells at a glance the amount of muriatic acid you need to make up various volumes of different Baumé solutions.

The same data sheet gives advice on the safe handling of muriatic acid, and lists the characteristics of Hooker muriatic.

"Hooker White" is a grade of muriatic acid that's probably one of the purest you can buy in volume anywhere. It's free of arsenic, contains no more than .003% sulfates, .0001% iron. Like Hooker's standard grade, "Hooker White" is shipped in 13-gallon glass carboys and rubber-lined tank cars. 18°, 20°, and 22° Baumé.

For a sample of either "Hooker White" or standard, write us on your business letterhead.

Check items you'd like to receive:

☐ **Caustic Soda Buyer's Guide.** Lists advantages of 50% and 73% solutions; comparative costs; capacities of tank cars and other containers; useful shipping information.

☐ **Bulletin No. 454.** Helpful information on PARADI: for repackagers and processors.

Keep your file up-to-date with technical data sheets on these Hooker chemicals:

☐ Caustic soda (standard grade)
☐ Caustic soda (rayon grade)
☐ Paradi (Hooker paradichlorobenzene)
☐ Muriatic acid

Clip and mail with your name, title, and address.

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SPECIALTIES . . . . .

and zirconium salts (to check perspiration).

• Windex-maker Drackett Chemical Co. (Cincinnati) offers a room deodorizer in a Windex-type spray bottle. Dazy Spray Air Freshener with re-usable sprayer costs 49¢.

• Crude sulfate turpentine odors are said to be eliminated chemically by Alamask OTA and OTB, two new products of Rhodia, Inc. (New York). The products are applied in a two-stage operation.

• To eliminate odor and bacteria from diapers, Heigate Products, Inc. (Toledo) has a new product called Diaper Do. It contains *p*-chloro-*m*-xylenol (PCMX), will retail at 49¢/4-oz. bottle in supermarkets and grocery stores.

•

Protective Paste: Although Lever Bros. has been reluctant to discuss the antibiotic additive content of its Shield tooth paste (*CW, Oct. 22, p. 118*), the firm recently got a patent on that type of dentifrice (U.S. Pat. 2,723,217). The patented Lever product, worked out by Sol Gershon and Oscar Neiditch, contains 0.005-0.5% of tyrothricin, and 20-80% of a mixed polishing compound (1-76% of an insoluble salt of polymetaphosphoric acid, 76-1% of calcium or magnesium phosphates or carbonates).

•

Cloudy Closet: To put a cloud in the closet, put one tablet on a plate, ignite, close the door. The tablet, Moth-Cloud (Continental Chemists Corp., Chicago) produces a white, closet-filling, moth-killing cloud said to neither stain nor leave odor in clothes.

•

For Rent Raincoats: Torn raincoats, hot water bottles, or rubber boots are reparable with a new chemical vulcanizer produced by Patch Rubber Co. (Akron, O.). It sells for 79¢, doesn't require vulcanizing equipment.

•

Filler Item: A new aerosol contract filling, loading and packaging company — Aerosol Techniques, Inc. — has opened shop in Bridgeport, Conn. The firm is headed by H. R. Shepherd, formerly of Connecticut Chemical Research Corp. Separate research laboratories have been set up for each of the company's three divisions: cosmetics, pharmaceuticals and general chemical specialties.

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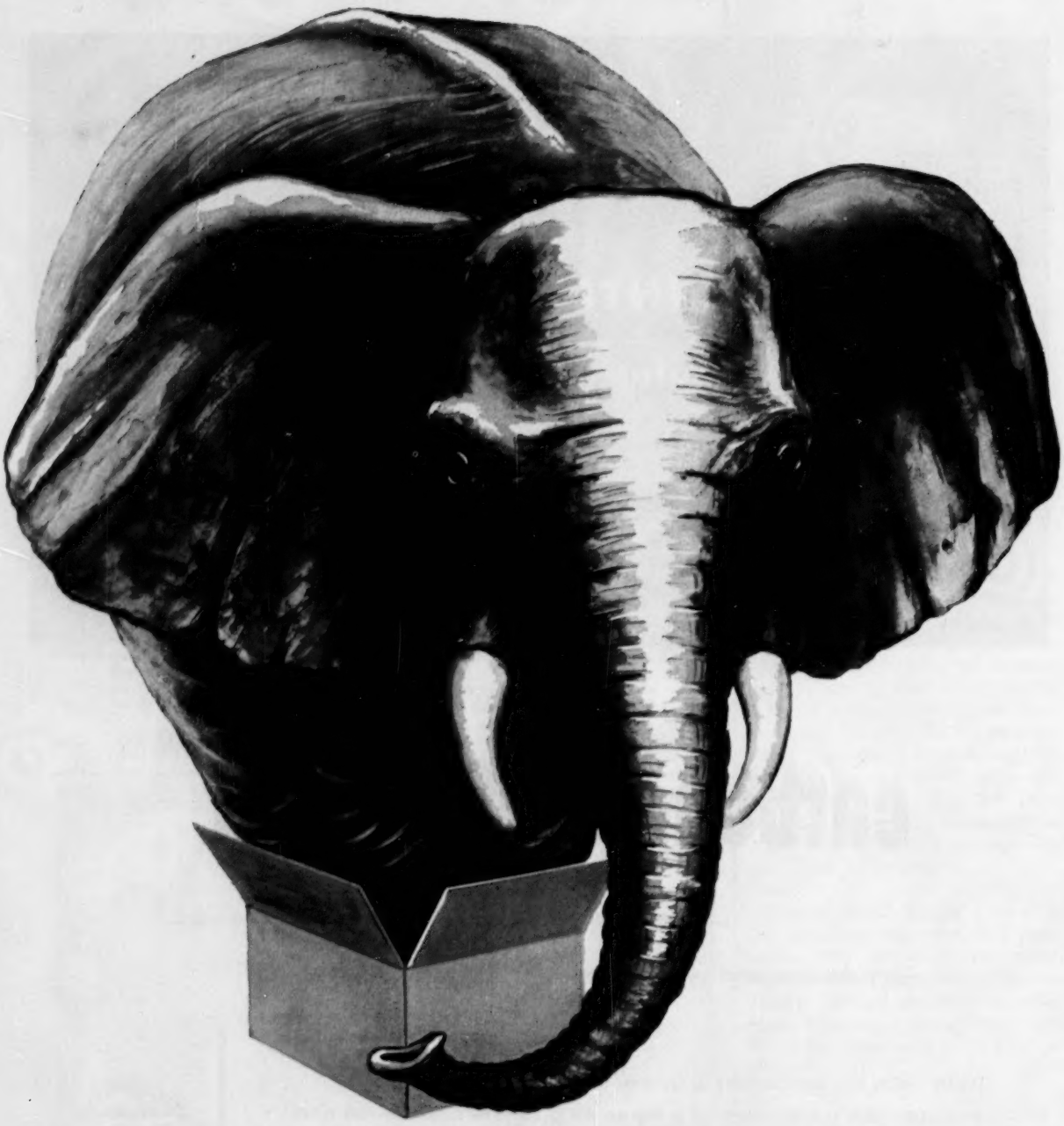

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CHEMICAL WEEK
November 26, 1955

There will be a West Coast counterpart to Hercules' East Coast Ziegler polyethylene plant, but on a larger scale. Koppers has teamed up with Brea Chemical to build a 50-million-lb/year polyethylene unit at one of Union Oil's (Brea's parent) refineries—probably at San Francisco. Completion target: mid-1957.

Koppers is an early licensee of Ziegler's, while Brea has looked at both Phillips and Ziegler before going ahead on the Koppers deal. Union's hypersorption process might well be used for purifying the ethylene stream.

•

You can expect to hear more about a newly formed firm, Metallurgical Resources, Inc. It's going to build a 10-ton/day pilot plant to explore the commercial possibilities of the Sill process of extracting cobalt, copper, nickel and iron from low-grade ores. Developed by Harley Sill, a California consulting metallurgical engineer, the process is aimed particularly at ores that run high in sulfur and arsenic.

It's drawn some favorable notices from metallurgical experts, but so far, it has been tried only on a small scale. Metallurgical Resources has received the necessary money (through a public offering of stock), is this week looking over sites around New York and Philadelphia. If the pilot-plant process proves out, the next step will be a 50-ton/day unit.

Essentially, the process is a carefully controlled autoclaving of metallic concentrates, which reduces the arsenic and sulfur content to less than 2%. On a typical complex cobalt-copper ore, for instance, it would remove the arsenic and sulfur to leave an ore that could be separated into iron oxide, copper, cobalt (or cobalt oxide) and nickel (or nickel oxide).

Although no patents have been granted on it, applications are in the mill.

•

You'll make a lot of money if you develop a good, economical synthesis of sesamolin—a sesame oil derivative that is the most potent pyrethrum synergist yet discovered.

Morton Beroza, organic chemist of the U.S. Department of Agriculture's Beltsville, Md., agricultural research center, elucidates the compound's structure, reports it able to boost pyrethrum's fly-killing activity by 31 times (in a 1:1 by weight mixture). The best commercial synergists (piperonyl butoxide, etc.) hike the insecticide's activity about 12-fold, in a 5:1 synergist-to-insecticide ratio.

Sesamolin is 2-(3,4-methylenedioxyphenoxy)-6-(3,4-methylenedioxyphenyl)-*cis*-3,7-dioxabicyclo-(3.3.0) octane—admittedly a formidable synthesis problem. But the potential reward is well worth the try: synergists are now incorporated in some 50 million lbs. of pyrethrin-continuing insecticides sold annually in this country alone, for control of flies, mosquitoes and other insects in homes, restaurants and barns.

A practicable synthesis of sesamolin is still to be worked out, although at least one chemical firm and several academic sources are engaged in research.

•

Although it's been unmistakably (and understandably) proud of its new catalytic hydrogenation process of making aniline, National Aniline has steadfastly refused to talk about it. A recent patent granted to the firm (2,716,-135), however, spells out a process that almost certainly is the basis for the firm's hush-hush operations at Moundsville, O.

It's a catalytic vapor-phase hydrogenation of nitrobenzene to aniline.

The key to the whole process is in the catalyst (nickel sulfide and amorphous alumina). By using the catalyst in a Downs converter, it's possible to get high yields (e.g., over 99%), long catalyst life (e.g., 1,600 hours without substantial decline in activity) and high productivity. In addition, the catalyst can be easily regenerated.

Incidentally, National Aniline has never admitted it publicly, but it's using the Biazzi continuous nitration process (*CW, Jan 19, '52, p. 45, et priori*) for the benzene nitration there.

•

Tests of the Patent Office's new system (*see p. 19*) of searching chemical literature are scheduled to get under way late in 1956. Intended to speed the processing of chemical patent applications, the method will be tried at that time on a series of 15,000 test cases.

Details of the supposedly rapid system are being held in confidence. But there's little doubt that the promising plan fits into the objectives under study by the advisory committee established to consider mechanization of the Patent Office's scientific literature operations.

Reason for the secrecy: Commerce Secretary Weeks and Patent Commissioner Watson are afraid that release of information on the new method would help the Russians with their own literature-searching problems.

•

Keep your eye on 3-bromo-4-nitrophenol, a compound that Bucknell University researchers are synthesizing for the U.S. Fish & Wildlife Service. The chemical reportedly has shown considerable promise as a killer of the sea lamprey—a predatory fish that is taking a terrific toll of Great Lakes food and game fish.

Fish & Wildlife wants to conduct field tests of the agent, but has been unable to get a supplier. Bucknell chemists will do the job by a synthesis reported in the 1927 literature.

•

What type of plant will tomorrow's nuclear power unit be? A. Babcock & Wilcox study group has just cautiously called a liquid metal fuel reactor (L.M.F.R.) "technically feasible in the near future" and said it "gives promise of being commercially attractive."

A 226,000-kw. L.M.F.R., it said, could be built and operated for 7-1 mils/kwh. Four reactors of that size at the same site (900,000 kw. capacity) would cut the cost to 6.5 mils. Compare that with Con Edison's 9 mils/kwh. at its abuilding nuclear power station at Indian Point, N. Y., and 7.5 mils/kwh. for its steam power station at Astoria, Long Island, N. Y.

In such a reactor, the fuel is a uranium-bismuth alloy. The beauty of it is that the chemical processing of the fuel is potentially cheap, can be integrated right into the reactor design. And chemical processing of fuel is regarded as the single most fruitful area in cutting nuclear power costs.

Brookhaven National Laboratories has carried the idea to an advanced stage of component development. It has described a fused salt extraction (similar to slagging) whereby the fission products are almost completely removed by a mixture of lithium and potassium chlorides. There are, however, some big, unsolved problems on such things as nuclear stability of the reactor and materials of construction.

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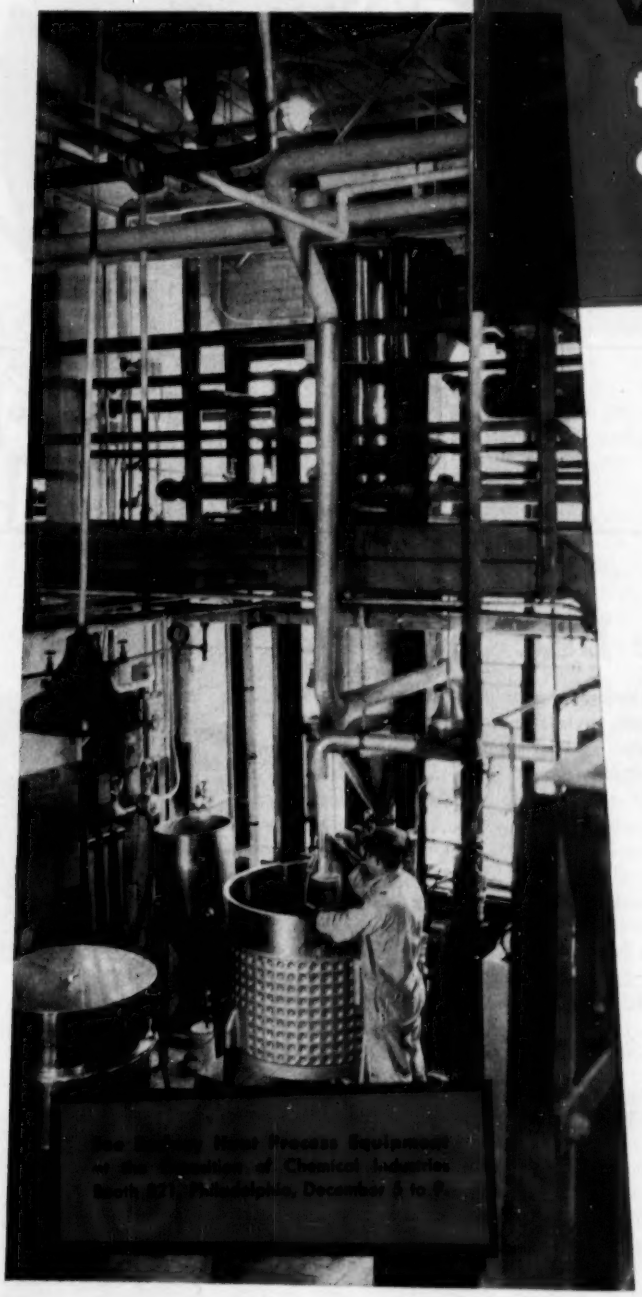

Schering Corporation, manufacturer of fine pharmaceuticals in Bloomfield, N. J., has concluded 8 months of favorable experience with the Turba-Film® Evaporator. Typical of numerous operations is the evaporation of chloroform from solution during a feed-to-product reduction of approximately 35 to 1 and 15 to 1 on successive passes (total reduction over 500 to 1).

Evaporation is done atmospherically at temperatures below 100°C. The small amount of material in process at any given moment minimizes the hazards of handling a highly heat-sensitive product.

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This is another example of Turba-Film Evaporator's capacity to expedite processing. Literature is available on request. Write us concerning your product or process, and arrangements for tests on our pilot plant.

Rodney Hunt Turba-Film Evaporator in use at Schering Corporation, Union, N. J., for various extractive processes. Evaporating capacity of this No. 4 unit is 1,200 pounds of water per hour. Schering will presently add a No. 6 unit of 4 times greater capacity. Workman is testing sample of "Meticorten", a new Schering drug, discharging into the concentrate cooler.

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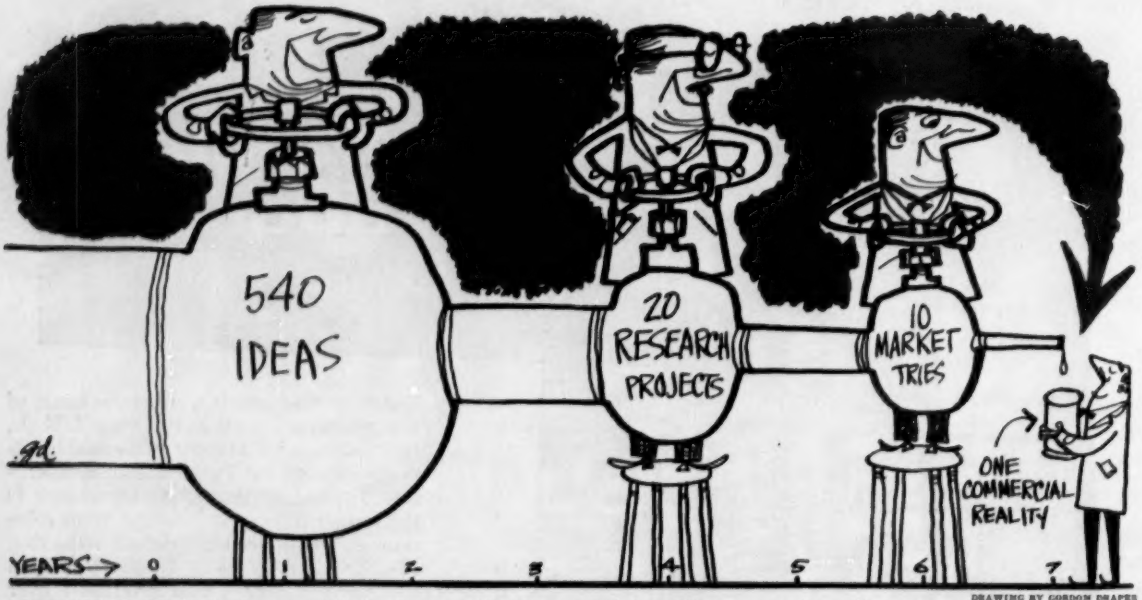


FILTERING IDEAS: Commercial development is long and trying. Management is seeking ways to get . . .

More Drops in the Bucket

Management people agree that commercial chemical development is a difficult and tedious filtering process.

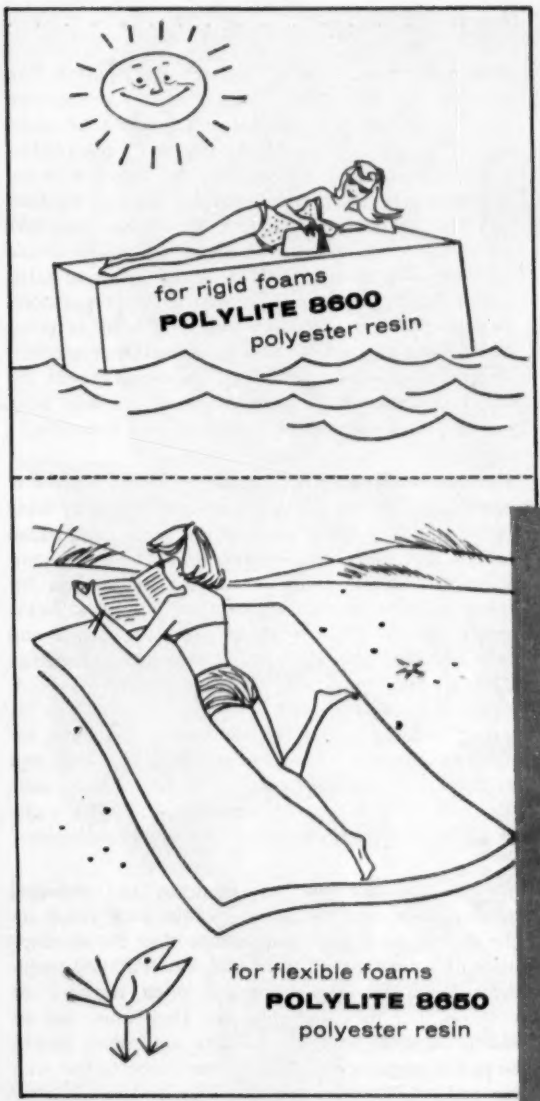
Fairly reliable estimates from several sources put a single successful venture as the result of 540 submitted research ideas resulting in 20 research projects and only 10 marketing attempts. Moreover, recent figures put a term of 5 to 7 years on the growth from idea to market.

Ways of shortening and expediting commercial development are varied and complex; they have received growing attention from chemical management men for some years.

To find out some of their thinking, *CW* this week poses a question to men active in the field: What can be done (from the standpoints of sales management, research direction, market research and product development) to make more research and marketing attempts pay off in a shorter period of time?

Donald Ballman, general sales manager, Dow: "To successfully convert a promising research idea into a profitable product requires an immense amount of investigation preparatory to the pilot plant. Specialists must develop information on process, product use, patents, toxicology, marketing and production economics. Teamwork is the keystone, and an answer to the problem might lie in stepping up the work tempo so that these studies are carried out simultaneously instead of in sequence—the usual way; although this might require more personnel. Another need is for good customer relationships so that management's 'calculated risks' can be taken into the field, or new avenues explored. Finally, research should be kept informed of industry's needs through the cooperation of development, field technical service and sales."

James Boyd, consulting chemical engineer, New York: "A good organization, and a sympathetic climate generated by top management, can provide a pervasive development atmosphere. This requires, in key roles, open-minded men with curiosity, operating freely. A common failing is to spread research too thin, by not eliminating unprofitable ideas early in the game. Research should always have an economic flavor so that commercialization is never out of sight. From the outset, time lags should be planned against; initial product quantities large enough to supply sampling demands will eliminate some. Although sales management should be fully aware of research developments, salesmen are frequently too busy selling to help sound out markets."



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POLYLITE 8600 (for rigid foams) — is easily mixed and applied. Foam sets within 10 to 15 minutes to a very uniform, finely grained structure. Needs no additional post-curing at high temperatures. It has good strength-to-density ratio, good dimensional stability and low heat transfer. *Well suited to insulation and flotation uses.*

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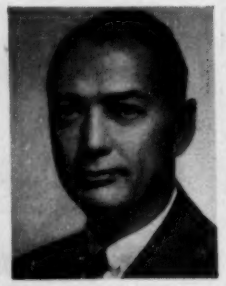
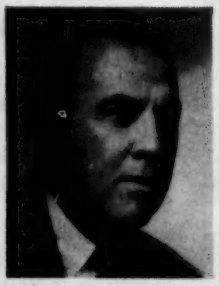
Robert Bateman, director, product development, Carbide and Carbon: "Communication is an important feature in sound development; it should be widespread and thorough. With this and 'new-product consciousness' as an atmosphere, the team can be enlarged to include all four segments working together. Sales should look for product applications and take time to dream with research. In turn, research should sit down occasionally and try selling ideas to sales, which should help eliminate unprofitable suggestions. In research, industry needs men who think in terms of investment return. To help them, market researchers can assist by maintaining continuous information on industrial needs for products related to company production. Product development can help bring projects to completion by setting and maintaining a well-planned timetable."



FABIAN BACHRACH

Kenneth Klipstein, general manager, research division, American Cyanamid: "A prime requisite is to bring to light at the earliest moment the many commercial factors that can determine success or failure of outstanding scientific achievements. Early meetings between sales and research people are helpful to both: research learns where its efforts are most needed, and sales is armed with time and information to organize its marketing approach. Once a product is born, potential customers need it in trial-lot quantities for testing and exploration; special versatile facilities for medium-scale production can greatly reduce time and cost in accomplishing this. Finally, continuing liaison—irrespective of specific programs—should be maintained between research and sales, to ensure a systematic approach to the selection of research projects for commercialization."



FABIAN BACHRACH

William LaLande, Jr., vice-president and technical director, Pennsalt: "Reactions within each group on the development team can tend to slow the development of a new project. Attitudes, intuition, and prejudices based on experience are often negative or cautious, but they are valuable. They must not be merely 'against,' however—positive suggestions should be part of negative criticism. Appreciaition of the need for patience by management and sales helps smooth out difficulties otherwise lengthened by lack of understanding. Market research timing is vitally important, for it can often eliminate a wasteful project from further consideration before it leaves the idea stage. Complete and authoritative technical preparation under the aggressive and coordinating guidance of the research director not only convinces the customer but also 'sells' the home team."

BLACKSTONE STUDIOS

James Park, vice-president, Enjay Co.: "One of the first requirements is complete information, including such matters as toxicity, handling cautions. Further, the producer should anticipate as many of the customers' tests as possible, although final testing is up to the customers. Here is where timing is important to avoid rushing or missing the market. Next, if possible, market research and sales people should be informed about the product so they can begin some exploration, even though it will probably change considerably before it's in final form. It is well if the research people direct their efforts to fields in which the company already has experience; but if new fields are explored, every effort should be made to utilize outside experience. Finally, in any development program there is no substitute for securing top personnel and coordinating their efforts effectively."

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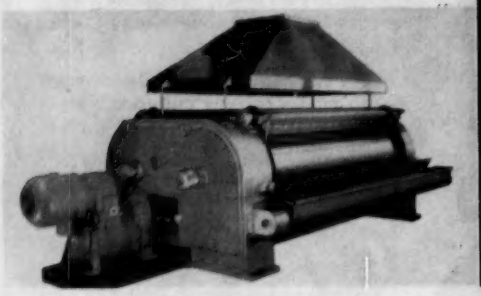

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Safety for Sales

MAKE SURE THE BELT is always fastened—that's what Ansul Chemical Co.'s (Marinette, Wis.) safety director, Joe Bannach (right), is telling company salesmen before they tramp down on the gas pedal. And he's doing it with conviction born of mounting experience.

The simple device of car safety belts is proving effective in keeping the sales force on the road and out of injury statistics. A recently compiled study shows that Ansul sales personnel were involved in 17 serious (over $250 damage to vehicle) accidents in the past four years since belts were installed. The record: four serious injuries and one fatality. Significantly, one injury and the lone fatality occurred when belts were not being worn. Company salesmen travel an aggregate of 1.5 million miles/year.

Salesman safety doesn't stop with belts, however. Ansul gives its drivers comprehensive driving tests. A road test is added to normal state tests.

Long cognizant of the need for safety in manufacture and handling of its products, the chemical industry will likely be a strong supporter of new car safety equipment now coming in. It's one way to help salesmen save themselves.

Briefs

from Recent Literature

Ethylene Oxide

Organic esters, useful as detergents and where slight acidity is desired without corrosive attack upon metals, as in metal pickling baths and in the removal of milkstone from dairy equipment, are prepared using lower alkyl-, carboxymethyl-, diethers of polyoxyalkylene glycols as intermediates.

Anti-foaming agent, effective for aqueous media in pressure boilers operating at 200 p. s. i. and above, is a diether reaction product of straight-chain 1:12 octadecanediol and ethylene oxide, in a 1:18-25 molar ratio, in the presence of an alkaline catalyst.

Regenerated cellulose films and sheets are given excellent slip characteristics and prevented from sticking together, even under pressure and elevated temperatures, by impregnation in the gel state with an ethylene oxide-stearic acid condensation product in combination with glycerol and colloidal silica.

Wetting and emulsifying properties are exhibited by hydroxy esters of long chain phosphonic acid, prepared by heating n-octadecane phosphonic acid and ethylene oxide in an autoclave in the presence of aluminum hydrosilicate as catalyst.

Water-in-oil type petroleum emulsion breakers are prepared by the oxyalkylation of certain phenol aldehyde resins, particularly those derived from a phenol having an ortho or para hydrocarbon substituent having 14 carbon atoms. Such products are also useful as wetting, detergent and leveling agents.

These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Ethylene Oxide in your products or processes. Permission to practice inventions covered by unexpired patents can be given only by the owners thereof.

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"Wyandotte's reliability helps us serve our many customers better"

— says Theron S. Dodson, purchasing agent, Barium Reduction Corporation, S. Charleston, W. Va.

"The barium chemicals we make are vital to many industries," states Theron S. Dodson, Barium Reduction Corporation. "For example, they are used in the manufacture of television tubes, electric light-bulb sockets, and molded rubber products — also in atomic research. All of these industries have their own peaks and valleys of production, and their demands on us vary.

"As a result, we have to have suppliers who can meet our ever-changing needs for raw materials — and meet them on time. Our suppliers must be able to meet our specifications, too. Anything less than the high-quality we require would only slow up our delivery, or cause trouble for our customers. I can assure you that we always receive excellent service and quality products from Wyandotte. When they say a car of soda ash or caustic soda is shipped, we can schedule our production on it."

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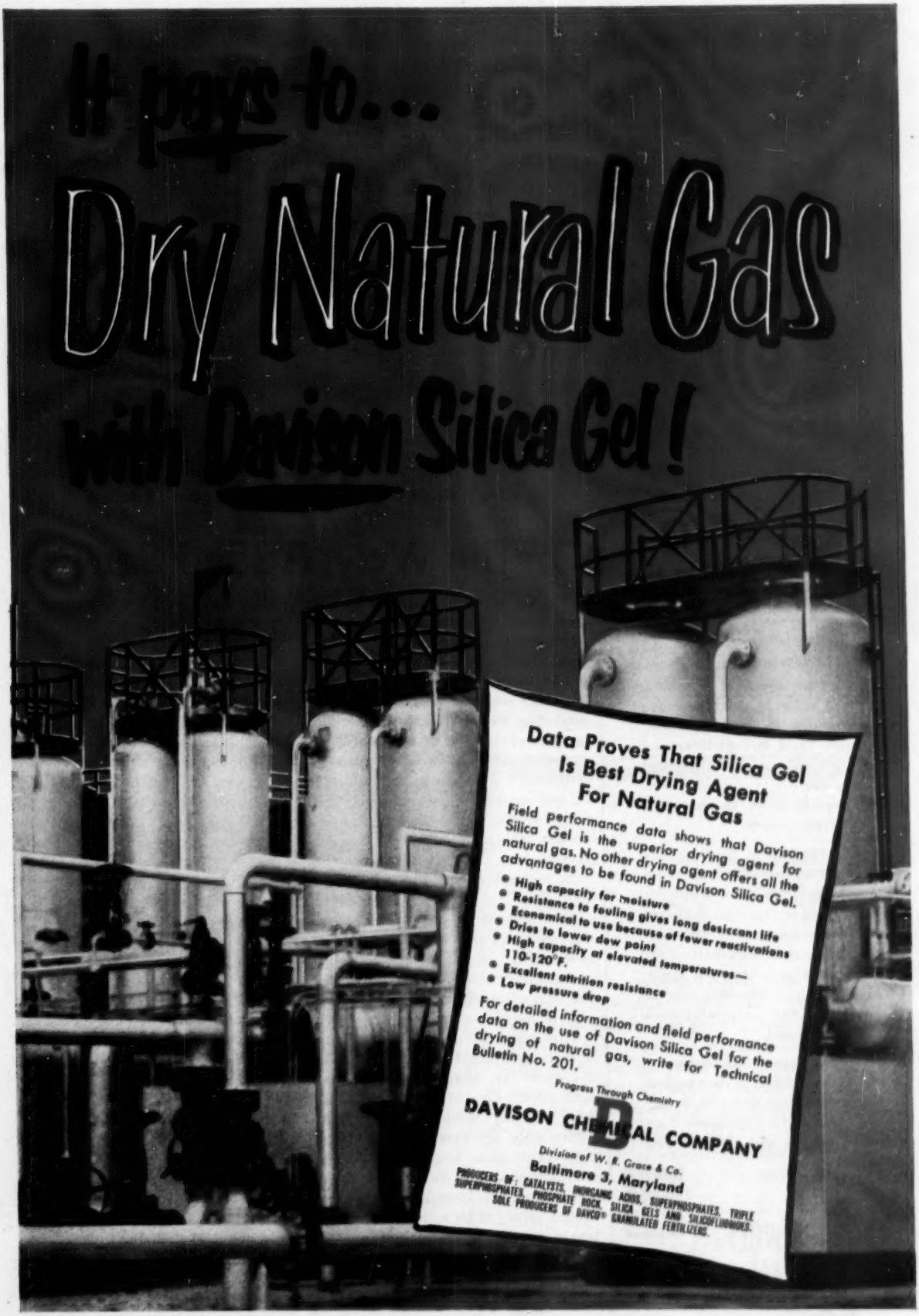
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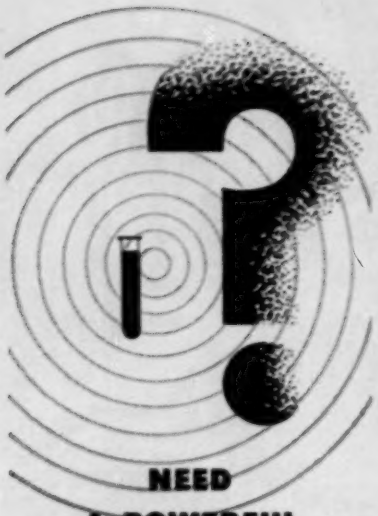

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As reducing agents Jacques Wolf Hydrosulfites find wide application in textile processing as well as in the manufacture of pharmaceuticals and chemical compounds. In the food processing industry Hydrosulfites are widely used as a bleaching agent. As a catalyst, our Hydrozin is employed for polymerization of Vinylmonomers.

Possibly you can hasten, improve or reduce costs of your present process or product through the use of Jacques Wolf Hydrosulfites. Complete data and samples will be sent you upon request.

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Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.

SALES YEAST: To sell food chemicals, Pfizer lab bakes a cake.

On the Way: Added Service

To the seasoned technical service man beset with dozens of customer problems, the prospect of more technical service—above and beyond the present level—hardly seems possible. Yet, with studied reflection, many are predicting that technical service will have nowhere else to move, will be extended still more in future years.

Hardly a week passes without news of additional service facilities. Phillips Chemical Co. is now building a sales service laboratory for its Marlex 50 polyethylene; earlier this year, Du Pont opened one for plastics (*CW, Feb. 26, p. 92*), is reportedly planning others; Bakelite Co. division of Union Carbide and Carbon recently installed (*CW, May 28, p. 60*) a lab for packaging materials. All attest to the important role tech service will play in tomorrow's selling.

That scientific service is assuming a more prominent place in sales is evidenced by more than expanding laboratories. One large chemical company recently studied the question, "Why does my customer buy from me?" The most important finding: technical service is its best salesman. As a result, this company is stepping up the ability of its salesmen to function as service representatives.

Steady, Sure: Despite the mushrooming of service facilities, executives are loth to predict jack-rabbit growth ahead. As J. L. Naylor, manager of the Dyestuff Dept., American Cyanamid Co., puts it, "We have expanded gradually in the past, and expect similar growth ahead." Other technical service executives say that future growth would be steady, in step with general industry expansion.

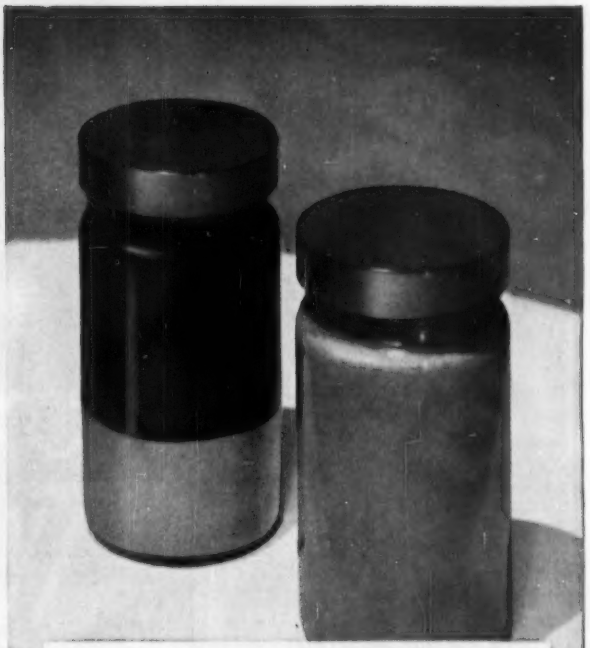
With increasing services, chemical companies are finding that the complexity of its service requests is also mounting. More and more, service answers seem to lie in sizable amounts of lab work that must be done by graduate scientists. Chas. Pfizer & Co. Inc. (Brooklyn), for example, reports that its professional service staff has increased fivefold in the past ten years.

It figures, too, that the demand for more-informed personnel will be on the ascent. Future salesmen, speculated one executive, will have to know more about their products, will have to actively continue their education after college. And, points out Shell Chemical Corp.'s manager of solvent sales, John O'Connell, future needs may make salesman specialization in one line turn upward. Shell has already done this for its resin materials.

Concomitant with the growing demand for services is a movement to place routine services near the customer. Already well established in

How Dowicide Preservatives solved bacteria problem for paint industry

Added to water-based latex paints, Dowicide Preservatives prevent bacteria breakdown of protein and extend paint shelf life



DOWICIDE PRESERVATIVES *made this difference. Latex paint control sample (left) was exposed for 20 days at room temperature (70°-75°F.). Bacteria attack caused the paint to "separate out"—and bad odors to develop. The protein lost its suspending powers and the pigment settled out. Test sample with Dowicide Preservatives added (right) was exposed to the identical conditions. Damaging bacterial action was prevented—protein was not degraded, pigment stayed in suspension.*

Dealers' investment is protected during long periods of paint storage. Dowicide Preservatives maintain the easy-to-prepare and easy-to-mix characteristics that make latex paints so popular with the increasing "do-it-yourself" market.

Industry generally is increasing manufacturing efficiency and improving product quality by using Dowicide® Preservatives. Fourteen different Dowicide Preservatives currently bring appreciable, specific benefits to the paint, paper and pulp, petroleum, leather, textile, adhesives, farming and other industries. Full information on profitable use of these versatile Dowicide Preservatives in your processing or selling operations can be quickly had by writing THE DOW CHEMICAL COMPANY, Midland, Michigan.

THE DOW CHEMICAL COMPANY
Dept. DO727A-3, Midland, Michigan

Please send me detailed information on the uses of Dowicide Preservatives.

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Title _____

Company _____

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For 40 years, we've concentrated on making better active carbons and charcoals for practically all adsorption uses. Your inquiries invited.

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ALL FOR SERVICE: Cyanamid lab studies complex dyeing problems.

some industries (dyestuffs, paper chemicals), the practice may catch on strongly in others. Decentralized routine servicing speeds results, frees main labs for more fundamental work.

Prefab Servicing: More exhaustive application development before products are offered for sale should be on the upswing in future years—that's the view of Carbide and Carbon chemicals' Arthur Steele, manager of technical service. With much of the development work already done, the customer is more willing to "give it a try." And it's more economical for the supplier to solve a host of service problems at once (as he does with thorough application development), have only minor adjustments to cope with later. In line with its own prediction, Carbide is now distributing the ninth edition of a booklet providing detailed formulas for the use of its products in emulsions and detergents, and has published comprehensive manuals covering most aspects of gas treating.

Status Quo Areas: Despite mounting service, mounting needs for more intensively educated men, and mounting costs, technical service directors don't see tech service's share of the sales cost dollar swelling. The ratio will stay at about the present level.

Also not likely to change much: the proportion of service done for the sake of customer good will to that performed in hopes of specific sales for a specific product; nor types of customer demands (large firms will continue to confine requests to complex problems, small firms to problems often readily solvable).

Nontechnical Salesman? Pressed by the need for more facts and figures in the salesman's tool chest, yet caught by a frightening, no-relief-in-sight-shortage of technical graduates, some companies are trying nontechnically trained men for sales. They are trained in the company's products, concentrate on accounts not likely to need much detailed help.

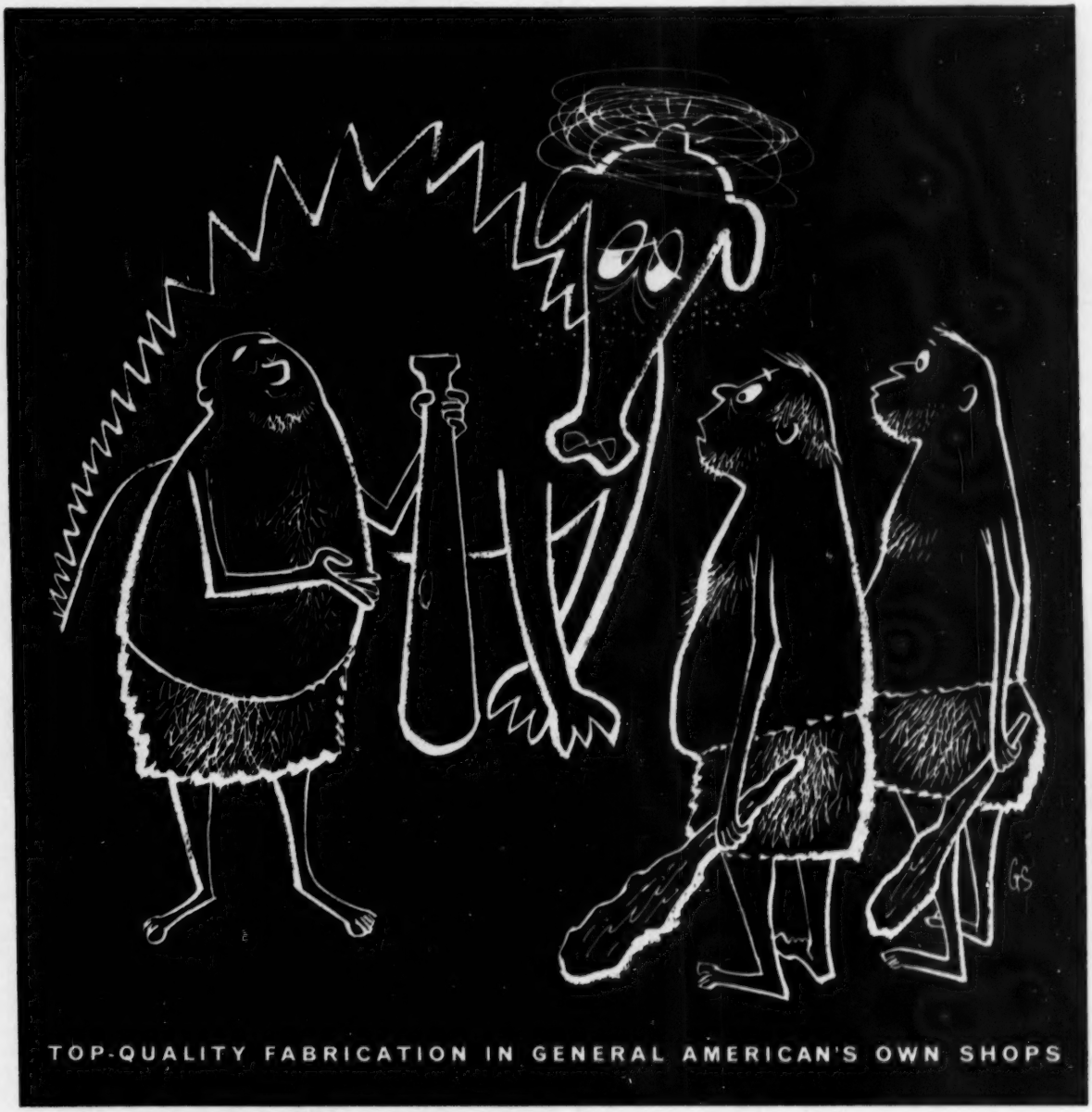
Formidable obstacles to such a practice exist, however. These include:

- Inability of an employer to offer the same advancement opportunity to the nontechnical man as to technical people in sales.
- The general difficulty such salesmen encounter in selling technical products for technical uses.

While this use of nontechnical salesmen may of necessity increase, it will

CARBIDE'S STEELE: Sees more product application development.

LOUISVILLE DRYERS are fitted to your job for faster, more efficient performance—lower cost in the long run!



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1. Initial survey and analysis of your particular problems.
2. Pre-testing in pilot-plant operation to assure performance.
3. Accurate design to meet your specific needs.
4. Top-quality fabrication in General American's own shops.
5. Follow-up checks after installation to guarantee mechanical perfection and efficiency.

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not lessen the role technical service will play in future selling. It merely means that more requests will be relayed back to the company for answering. And, come what may, a climbing prominence of technical service in sales seems assured.

•

Data from D. C.: Trade lists of foreign business firms now available from the U.S. Dept. of Commerce (Washington) for $1 include:

- Manufacturers, distributors and importers of paints, varnishes and pigments in Austria.
- Distributors and importers of chemicals in Italy, Mexico, Costa Rica, Morocco and the Netherlands' West Indies (separate lists).
- Importers and dealers in medicinal and toilet preparations in Ceylon and Syria (separate lists).
- Plastic manufacturers and molders in Brazil.

•

Tradename Directory: Hunting the owner of various tradenames is now easier. The second edition (expanded over 25%) of "Chemical Trade Names and Commercial Synonyms" is now available from D. Van Nostrand Co., Inc (Princeton, N.J.) for $8.

•

Ready for Reference: Carbide and Carbon Chemicals Co. (New York) now has two new brochures. Methyl n- propyl ketone is the subject of one; activated carbon in solvent recovery systems is the concern of the other. Detailed information on system efficiency, operation, recoverable solvents, costs, and equipment is included.

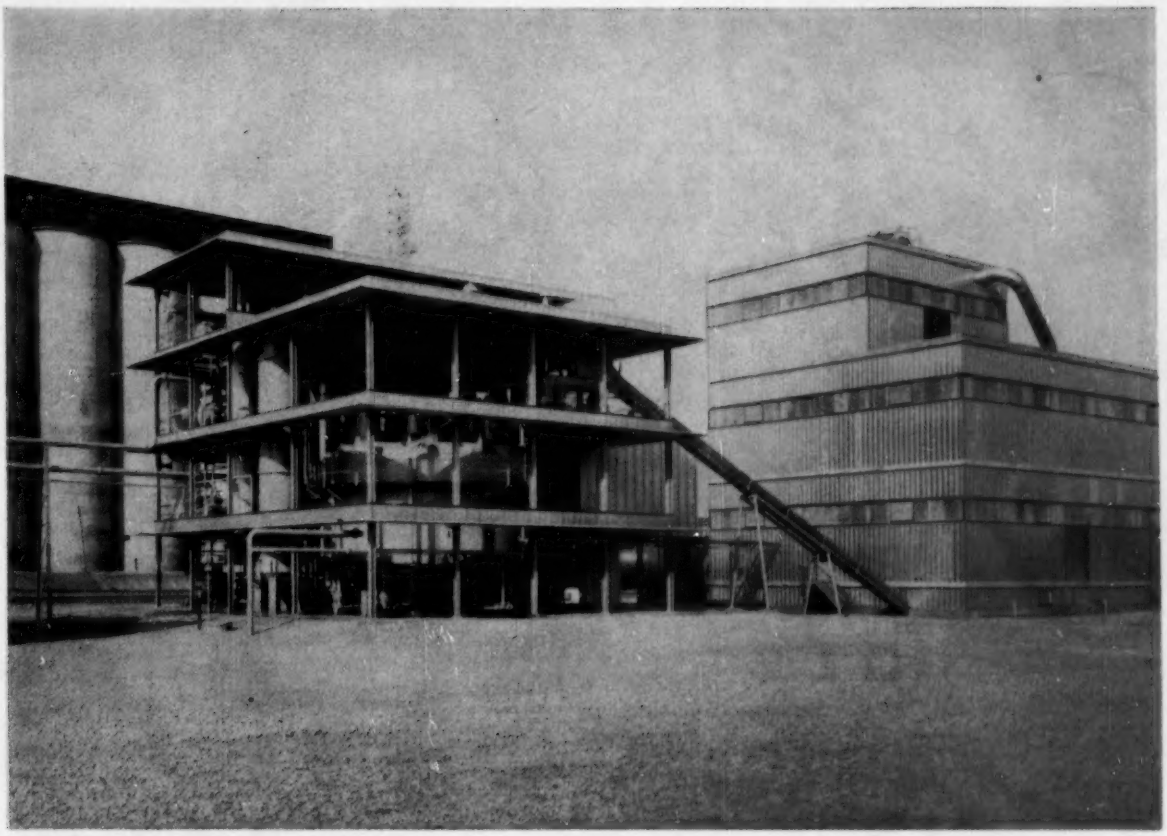
- Polyvinyl chloride resin—technical bulletin outlines physical properties of Marvinol VR-30 resin, behavior in premixing, fluxing, calendering, extrusion, and injection molding operations. Naugatuck Chemical Division, United States Rubber Co. (Naugatuck, Conn.).
- Dow catalog—new edition contains data on 350 chemical products. Included are product names, chemical formula, physical description, common physical constants, and solubility in water, methanol and ether. Dow Chemical Co. (Midland, Mich.).
- Urea and melamine coating resins —Formulations for baking enamels comprise bulk of 11-p. booklet. Technical data on cure-rates, viscosities, general properties, and determination of a coating resin solution's solids content are also covered. Barrett Division, Allied Chemical & Dye Corp. (New York).

"This year I'm using more than ever before!"
THIS YEAR many of the best farmers are using more than ever before. With farming costs going up & profits coming down, they want the extra yields of high crops that fertilizer adds to every acre at such low co
Fertilizer Grows Farm Profits

One for All

PROMOTE a general class of chemical products and your company's products benefit, too. With that idea in mind, the Nitrogen Division of Allied Chemical & Dye Corp. is launching a series of "public relations"-type advertisements aimed at selling farmers on the idea of using more fertilizer. General theme: fertilizer grows farm profits.

Institutional in character, the ads' only reference to the company is a small logotype. Nitrogen Division will follow its first ad (*see above*) with others, some of which will offer booklets of practical importance to the farmer.



Processing and storage facilities of Central Soya's new plant at Chattanooga. The 26-foot-diameter, 850-ton-per-day giant Blaw-Knox Rotocel Extractor is installed in the four-level solvent extraction structure (above, center).

Largest Blaw-Knox Rotocel Extractor ever built installed in Central Soya's new Chattanooga plant

Central Soya Company recently placed a new modern soya bean processing plant into operation at Chattanooga, Tenn. The extraction system, which includes a unique distillation system, was designed by Blaw-Knox engineers, and enables Central Soya to serve the expanding Southern agriculture.

The heart of the oil extraction building is the giant 26-foot-diameter, 850-ton-per-day Blaw-Knox Rotocel, the largest unit fabricated to date and the first to be peripherally driven. It puts soybean flakes through seven stages of percolation, using hexane as the solvent for oil extraction. This raises total installed Rotocel capacity to 2,300,000 tons per year, and the total Blaw-Knox built solvent extraction yearly capacity to 3,700,000 tons per year (equivalent to about 120,000,000 bushels of soy beans annually).

This is but another example of a plant designed by Blaw-Knox specialists to meet a specific need. Why not discuss your plant expansion or modernization plans with our experienced engineers? They will gladly make recommendations.

The Blaw-Knox Rotocel Extractor provides:

- Complete oil extraction at low ratios of solvent to flakes
- Installed capacity to meet individual plant requirements
- Small space requirements
- Mechanical simplicity
- Minimum maintenance
- No filters required

BLAW-KNOX

BLAW-KNOX COMPANY

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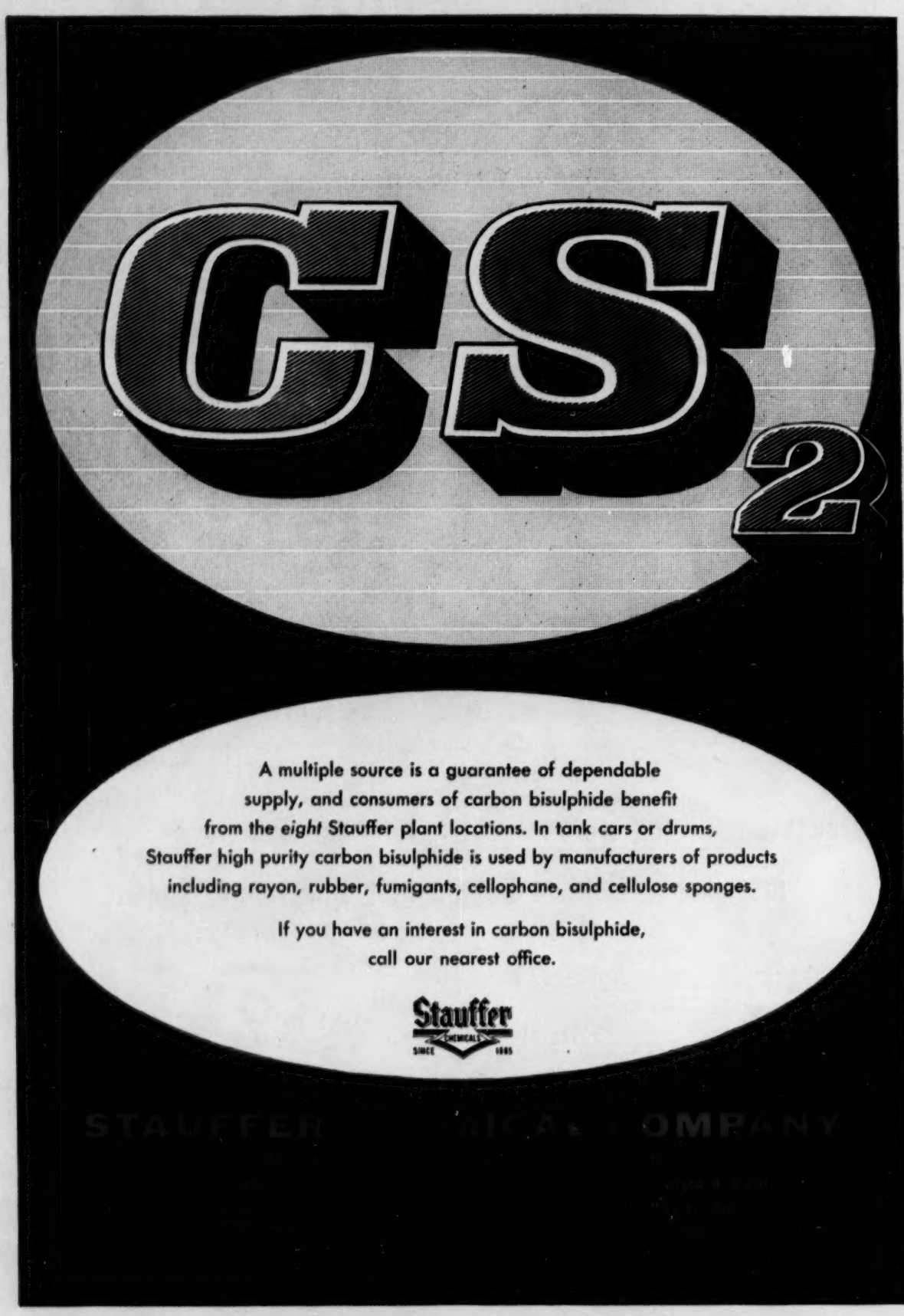
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CCDA-CMRA PROGNOSTICATORS * with a feel for the future.

A Good Look at Synthetics

Last week some 450 market men packed into the terrace-adjoined Rainbow Room of midtown Cleveland's Carter Hotel, heard spelled out, by seven experts (see cut), predictions and problems concerning many established and upcoming man-made fibers. The occasion: a two-day joint meeting of the Commercial Chemical Development and Chemical Market Research Assns.

Continued growth in production and consumption of chemical fibers—both 100% synthetics as well as newer blends—appears assured. Underscoring the bright outlook, General Aniline & Film's Paul Choquette noted that world output of noncellulosic fibers gained 23% last year to establish a new record of 478 million lbs.

Projected world capacity for these synthetics: 901 million lbs. by the end of 1956.

In the U.S. specifically, he asserted, production is definitely on the uptrend (*see table*), and increasing use of the fibers will open wider markets for many textile chemicals. Choquette, who discoursed on "Dyeing the Newer Synthetic Fibers," pointed out that industry "has come to realize that the coloring of these new fibers by practical methods, in shades that meet end-use requirements, is of as much importance as is attainment of improved physical properties."

Chemical auxiliaries consumption has been, and can continue to be, greatly influenced by synthetics' dyeing procedures. Selected anionic, nonionic or cationic materials perform roles in scouring, as dye assistants in promoting leveling, as retarding agents to improve penetration, as assistants and stabilizers of dyes used in dyeing of blended fibers. The textile chemical market in these fields for all fibers, said Choquette, was estimated at 96 million lbs. in 1950.

New Splash: Earlier in the day, Du Pont's Joseph Rivers, Jr., observed that during the past 20 years the textile industry has been offered a constantly increasing selection of synthetic fibers. In sheer numbers, he said, the fibers based on acrylonitrile lead the field, especially in Europe. The polyamides have followed closely, and there has been a scattering of fibers based on polyvinyl chloride and its copolymers. Only two polyesters have appeared.

And latest, with no commercial companions as yet, is Du Pont's Teflon tetrafluoroethylene fiber.

Du Pont was faced early with the problem of determining what the material was good for, and what sort of markets it might hope to enter in the face of competition from existing organic fibers, from glass fibers, and from other materials such as woven stainless steel wire fabrics.

"Looking at the combination of low modulus, high density, difficult dyeability, greasy tactile quality, and high initial price, we could obviously predict that this fiber was not going to be of any immediate interest in the general apparel market."

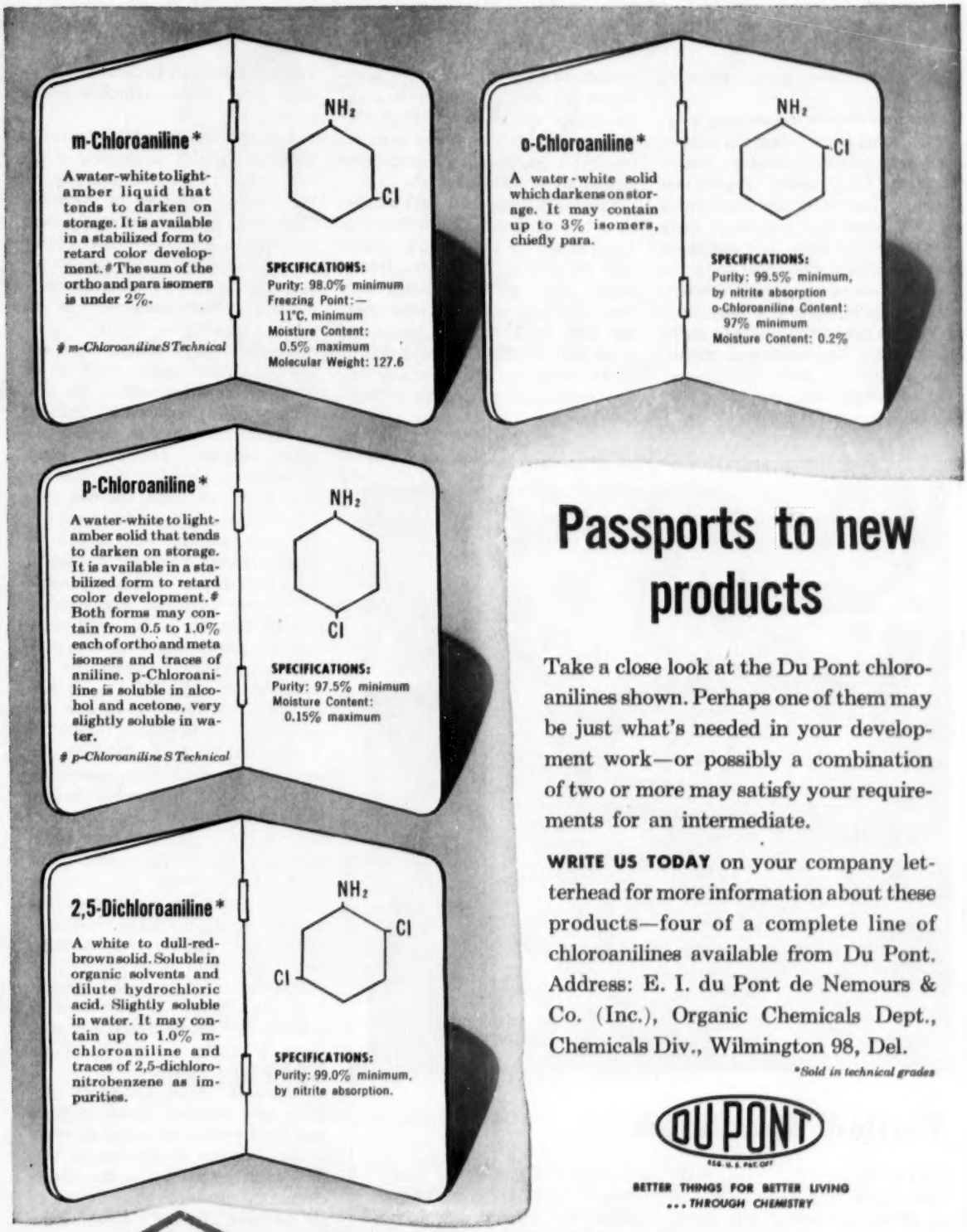
Teflon's principal markets currently are industrial. Some of the uses originally projected: packing for shafts on chemical pumps and valves; filtration of corrosive liquids; filtration of particles from high-tempera-

* Celanese's Samuel McFarlane (*right front*) shows off cellulose triacetate skirt and shirt to other panelists: (*left to right*) Henry Voskamp, Jr., Barrett; Theodore Cooke, American Cyanamid; C. W. Bendigo, American Cyanamid; Paul Choquette, General Aniline & Film; Joseph Rivers, Jr., Du Pont; O. L. Wheeler, Air Reduction.

U.S. OUTPUT OF NONCELLULOSIC SYNTHETIC FIBERS IS ON THE INCREASE:*

FIBER	CURRENT PRODUCTION (million lbs./year)	EXPECTATION
Nylon	200	300 million this year
Dacron	15	30 million capacity
Orlon	40	30% increase
Dynel	6	expansion on way
Acrilan	30	growing use
Vicara	6-10	use increase

*From paper by General Aniline & Film's P. J. Choquette.


m-Chloroaniline *
A water-white to light-amber liquid that tends to darken on storage. It is available in a stabilized form to retard color development. # The sum of the ortho and para isomers is under 2%.
m-Chloroaniline S Technical
NH2
Cl
SPECIFICATIONS:
Purity: 98.0% minimum
Freezing Point:— 11°C. minimum
Moisture Content: 0.5% maximum
Molecular Weight: 127.6
o-Chloroaniline *
A water-white solid which darkens on storage. It may contain up to 3% isomers, chiefly para.
NH2
Cl
SPECIFICATIONS:
Purity: 99.5% minimum, by nitrite absorption
o-Chloroaniline Content: 97% minimum
Moisture Content: 0.2%
p-Chloroaniline *
A water-white to light-amber solid that tends to darken on storage. It is available in a stabilized form to retard color development. # Both forms may contain from 0.5 to 1.0% each of ortho and meta isomers and traces of aniline. p-Chloroaniline is soluble in alcohol and acetone, very slightly soluble in water.
p-Chloroaniline S Technical
NH2
Cl
SPECIFICATIONS:
Purity: 97.5% minimum
Moisture Content: 0.15% maximum
2,5-Dichloroaniline *
A white to dull-red-brown solid. Soluble in organic solvents and dilute hydrochloric acid. Slightly soluble in water. It may contain up to 1.0% m-chloroaniline and traces of 2,5-dichloronitrobenzene as impurities.
NH2
Cl
Cl
SPECIFICATIONS:
Purity: 99.0% minimum, by nitrite absorption.

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Take a close look at the Du Pont chloroanilines shown. Perhaps one of them may be just what's needed in your development work—or possibly a combination of two or more may satisfy your requirements for an intermediate.

WRITE US TODAY on your company letterhead for more information about these products—four of a complete line of chloroanilines available from Du Pont. Address: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Chemicals Div., Wilmington 98, Del.

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ORGANIC CHEMICALS DEPARTMENT

ture or corrosive gases; gasketing fabrics.

Japanese Choice: Speaking of polyvinyl alcohol fibers (vinylon), Air Reduction's polyvinyl alcohol project manager, O. L. Wheeler, revealed that Japanese interest in the fiber began in 1935 when they initiated a study of all synthetic fibers, and concluded that polyvinyl alcohol held forth the most promise of being made economically from Japanese raw materials.

Vinylon production in Japan seems destined for an accelerated expansion. Output in 1950, for instance, was something less than a million pounds. This year, production is expected to top 20 million lbs. and move up to about a 35-million-lbs./year rate by '56. Some estimates for 1957, points out Wheeler, have ranged above 60 million lbs.

Consumption of polyvinyl alcohol resin (raw material for the fiber) in Japan is rapidly approaching current U.S. production, though the latter's output winds up in uses other than fiber. (In response to a direct question from the floor, at the conclusion of his talk, Wheeler indicated that to his knowledge no U.S. company was near commercial production of polyvinyl alcohol fiber. In Germany, however, early commercialization is anticipated.)

Acrylic Scan: The market for textile fibers in the U.S. is growing at the rate of about 90 million lbs./year, C. W. Bendigo, manager of American Cyanamid's fiber market development department, told the CCDA-CMRA market analysts. And the real poundage increase in fiber consumption is accruing almost completely to the newer synthetics.

Consumption of cotton, rayon and acetate remains static; wool is decreasing: but the growth of the noncellulosics is "phenomenal." Included in the category: nylons, textile glass, saran, acrylics, polyesters, azlon, polyethylene, polyvinyl chloride, and dinitrile. Of all these, the two most important are nylons and acrylics.

The development that opened the biggest market today for acrylics is the high-bulk process; it's responsible for acrylics' being the new standard fiber for sweaters. In two short years, Bendigo says, acrylic fibers have almost completely captured this 32-million-lbs./year market. These sweaters are 100% acrylic and vastly outperform the replaced fiber (wool).

There are some fertile fields for acrylic staple, and Bendigo expects impressive percentage increases in consumption by various classes of textiles in the next five years. In acrylic use in household textiles, for example, the jump in 1960 over '55 may be 1,000%. In children's textiles, the increase expected is 500%; industrial 200%; men's and boys' textiles, 75%; and women's and misses', 25%.

For the immediate, and possible long-range, future, he concluded, it is likely that acrylic fibers may continue to parallel the growth of the man-made cellulosics.

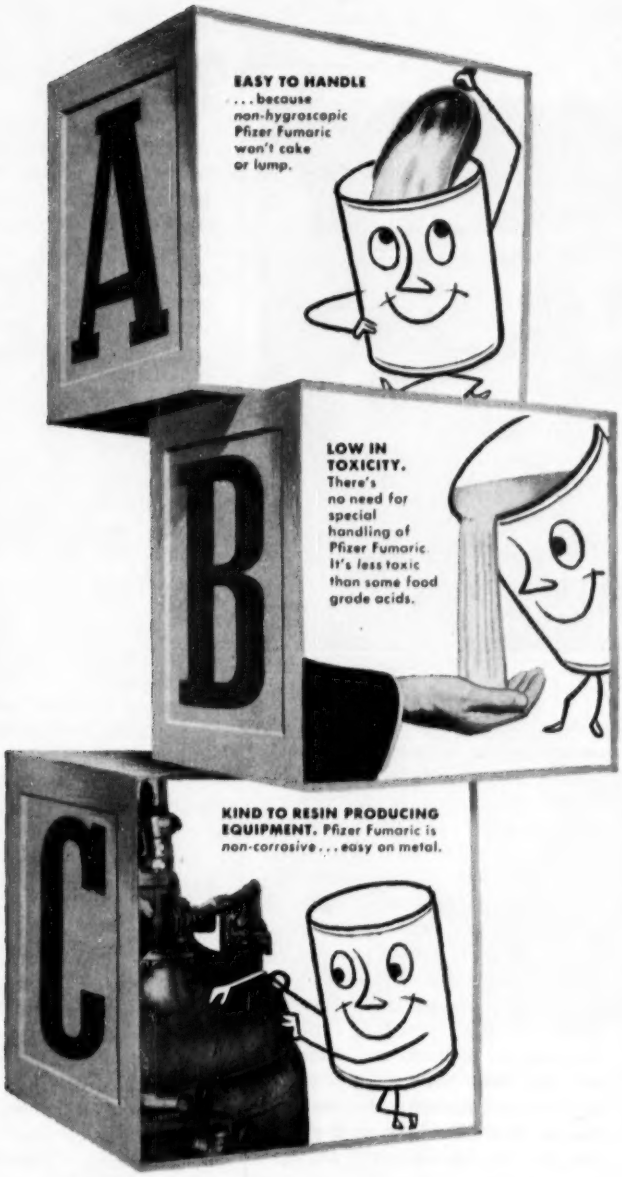
Comeback? Arnel, Celanese's relatively new cellulose triacetate fiber, may soon restore the cellulosic fibers to the "position of prominence that they once enjoyed before the newer, completely synthetic fibers began to get the most attention." Thus did the firm's manager of laboratory facilities, Samuel McFarlane, depict another facet of the burgeoning man-made textile market.

McFarlane also mentioned that the triacetate material will be important to the chemical industry because it opens up demands for new chemicals

Platters Spin Sales

PHONOGRAPH RECORDS were at one time major consumers of shellac, but now a large chunk of this business has been usurped by plastics. Indicative of the encroachment: by the end of this year the records industry will have consumed some 20 million lbs. of vinyl and about 7 million lbs. of polystyrene to produce the nearly 250 million records that will be sold.

Biggest factor in the sale of such records has been the ubiquitous "juke box" (*see cut;* with juke box favorite Gizelle MacKenzie), itself an important consumer of plastics. Once considered a typically American phenomenon, the music player is now a familiar scene in more than 40 nations of the world.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Helium Floater

THIS WEEK — Thanksgiving Day — an estimated 2-3 million people on the spot, plus many more millions via television, were again treated to a fantastic annual event commemorating the advent of the holiday season in New York City — Macy's blocks-long parade.

But only a few of the viewers were aware of the chemical market significance—that this year there were only four of the stories-tall, rubberized helium-borne balloons rather than the usual six.

Actually, the parade came close to being devoid of all but two of the mirth-provoking characters because of the continuing critical shortage of helium, and chances are the same problem will arise next year. Reason: Bureau of Mines production (currently the only source of helium) will amount to only about 216 million cu. ft. during fiscal 1956, while consumption will likely top 240.

Some two-thirds of the helium produced goes directly to defense-related agencies, including the AEC, Weather Bureau, and the military services; and adding a spurt to consumption is broadening use in shielded-arc, electric welding (*see cut*).

One of the four Goodyear Tire & Rubber-made balloons for Macy's parade is Mighty Mouse (*see cut*), some 69 ft. high, 42 ft. wide, and taking some 10,000 cu. ft. of helium to keep it air-borne.

as well as maintaining well-known demands.

Arnel, he noted, has been on the market only a short time, but on the basis of experience in dyeing and finishing nearly 2 million yds. of fabrics, Celanese can report that customer acceptance has been "very good," extensive laboratory tests have been most encouraging, and "no unsolvable problems have been encountered in its processing and utilization." Add, too, he says, "high quality at a low price."

Polycaprolactam Ready: Allied Chemical & Dye is now producing and offering for sale the first commercial production in this country of polycaprolactam. Growth possibility of this nylon, known as Type 6 (*CW, Oct. 23, '54, p. 95*), was discussed at the Cleveland get-together by Barrett's manager of thermoplastic sales, Henry Voskamp, Jr. Nylon 6's ability to be extruded easily, Voskamp declared, coupled with its controllable crystalline nature, makes it possible to form a clear film with high strength, toughness, abrasion and heat resistance. Bright potential outlets: as a laminating material for vinyls, polyethylenes, paper and other materials both in plain and decorative forms.

Possible large uses, too, are indicated in industries such as luggage manufacture. He also observed that its qualities may make it "quite possible to open the field of low-pressure spray-type unbreakable bottles for the cosmetic industry."

Finishing Rundown: A challenge was tossed to fiber manufacturers by American Cyanamid's Theodore Cooke in his talk on "Finishing of Synthetic Fabrics" at the windup of the day's technical session. Fibermakers should try to "build a chemical handle on the fiber so that functional finishes can be chemically reacted with the fiber to make it durable."

Cooke thoroughly covered the field of finishing; outlined the use of resins in treatments for wrinkle resistance, shrinkage control, water repellency, etc.

Considerable progress has been made in the development of new and improved nonwoven fabrics, said Cooke, and here, too, a mixture of resins has overcome earlier deficiencies.

When you use USS Steel Drums, you are assured that your quality controlled product will arrive at your customer's door just as pure as the moment it left your plant. After each USS Steel Drum is shaped, formed and welded, dirt and grease are removed by alkali wash to prepare for rust-inhibiting phosphate treatment.

Prior to the application of the rust-inhibiting coating, complete scale removal on the entire interior and exterior surfaces of the drum parts is completed.

Then, with all surfaces almost antiseptically clean, every inch of the container surface is treated with a special phosphate formula that inhibits rust. This careful processing means that your own rigid quality control measures are extended right to your customer's door.

USS Steel Containers are available in capacities from 2½ to 110 gallons, in stainless, galvanized, tinned, painted or decorated . . . with a variety of openings and fittings to meet your requirements.

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Market
Newsletter

CHEMICAL WEEK
November 26, 1955

Aspirin makers, as well as their customers, have their headaches. Competitive price actions in some areas is one factor behind Monsanto's posting of lower official schedules on acetylsalicylic acid. The company says that its new processing plant in St. Louis is now producing at a good clip, and is "turning out a better product more economically." Hence, savings will be passed on to attract more customers.

The reductions (1 to 3¢/lb., depending on type and quantity) though, will more than likely become industry standard before the week is out.

Output of acetylsalicylic acid in the U.S. is currently running at about a 12 million lbs./year rate, but an expected seasonal turnup in consumption will probably boost the country's '55 production total to something above 14 million lbs.

Ethylene glycol marketers are benefiting by expectations of nippy weather. Sales are reported strong for this time of the year, due to heavy demand for antifreeze. Other glycol outlets, too—for example, plastics manufacture—are taking considerable quantities.

Indicative of the better market: latest government figures on production (for August) show a 5% increase over the previous month—a near-87 million lbs. compared with July's 82.8 million.

The same seasonal factor is responsible for the noticeable briskness in methanol sales. Supply of the material is generally quite adequate to cover trade requirements, but some consumers here and there may be hit by temporary shipping delays.

As far as prices are concerned, the present tenor of methanol business—for both antifreeze and other chemical uses—will probably keep today's 30¢/gal. (t.c.) price firmly pegged well into the new year.

And don't expect any near-future drop in refined glycerine prices despite the recent onstreaming of additional U.S. synthetic facilities. Reason: consumer pressure on available glycerine supplies have been—and will continue to be—fairly heavy (*see also p. 16*).

Crude glycerine isn't too plentiful, either. Imports have been slightly better this year than last; but with soapmaking on the skids, production of domestic crude glycerine has been cut substantially.

Synthetic detergents use continues to outpace soap use in the U.S. Latest survey of the industry by the Assn. of Soap & Glycerine Producers reveals that tonnage sales of the syndets (liquid and solid) in the first nine months of the year totaled 1,747 million lbs. (valued at more than $407 million)—up 11% over the same period last year.

Sales of solid and liquid soaps during the same '55 stretch amounted to a shade more than 1,057 million lbs., down 5% from '54's 1,119 million. Dollarwise, however, soaps were up a slim 1.6%, sold for a near-$249.5 million.

Third-quarter sales of soaps and synthetic detergents together came to approximately 1,047 million lbs., valued at about $248 million. That's a tonnage increase of 20% over the second quarter, and 13% above the comparable three-month period last year.

Now you can buy commercial quantities of methyl vinyl ketone from Pfizer. The company, heretofore producing the highly reactive chemical intermediate for its own use, will sell the material industry-wide.

Pfizer's fish line for markets—among manufacturers of plastics, adhesives, drugs, and chemical specialties—will be baited with these price lures: $5.50/lb. in 55-gal. drums; 10¢/lb. more than that for 5-gal. lots. Both are delivered prices.

•

Biggest price splash in the market this week is being made by National Distillers Products' U.S. Industrial Chemicals division: industrial alcohol schedules are going up. The firm's new prices—advanced by approximately 5% in bulk quantities—go into effect the first of the year.

New 190-proof tank car prices will be 42¢/gal. (up 2¢), while CD (completely denatured) 119 will move up to 43½¢/gal. All USI's specially denatured and completely denatured formulas, as well as proprietary and anhydrous grades, will also be advanced. C.l. and l.c.l. increases in some cases, however, will amount to slightly less than the bulk 5% hike.

Other producers are evaluating the change, and chances are that few, if any, alcohol customers will escape the higher first-quarter listings. Reason: most makers, busily filling orders for months, expect little tapering in demand. Add, too, the fact that ethanol prices haven't been raised in years.

Consumers will pay more for an extended line of tin chemical derivatives. Salts affected by the rising cost of the metal (now up 2¼¢/lb. to a spot level of 98⅞¢) include, among others, potassium and sodium stannates, stannic chloride, and anhydrous stannous chloride.

Firm is the word for nitric acid prices. If any changes occur in producers' schedules, observers believe, they won't happen before the second quarter of '56. Industrial and governmental requirements have kept the nitric market in a fairly tight position, and consumption is tabbed to remain high for some time.

Steel production, currently rolling along at a record-breaking pace, is a primary prop supporting nitric acid demand.

Copper sulfate supply, too, is still fairly tight, although some consumers report that the market appears to be a shade easier than it has been in recent weeks. But most find it generally difficult to get all they need—a condition likely to keep sulfate from toppling off its recently raised price perch (*CW Market Newsletter, Oct. 1*).

SELECTED CHEMICAL MARKET PRICE CHANGES
Week Ending November 21, 1955

	Change	New Price
UP		
Casein, imp., Argentine, acid-pptd., grd., bgs., c.l., duty paid	$ 0.0075	$ 0.2625
Propane, indust., tks., group 3, gal.	0.005	0.04
Sodium acetate, anhyd., bgs., c.l., wks.	0.01	0.13
Sodium bifluoride, bbls., c.l., wks., frt. eqld.	0.01	0.185
Sodium diacetate, 33-35% acidity, 250-lb. dms., wks.	0.01	0.15
Sodium fluoride, white, 97%, fib. dms., c.l., wks., frt. eqld	0.014	0.1390
Sodium stannate, dms., wks., frt. alld.	0.009	0.571
DOWN		
Acetylsalicylic acid, cryst., 20-40 mesh, 250-lb. dms, 1,000 lbs. or more	$ 0.02	0.56
Tallow, fancy, bleachable, tks., dlvd.	0.0012	0.0825

All prices per pound unless quantity is stated.

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DETERGENT SLURRY—for formulation—spray and drum drying.

SYNTHETIC OIL-SOLUBLE SULFONATES—various forms for many applications.

SYNTHETIC DETERGENTS—drum or spray dried.

Samples and technical information on NEOLENE 400 and a wide range of other Conoco Petrochemicals furnished by request on your letterhead.

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CHEMICALS DIVISION
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ATLAS POWDER COMPANY, CANADA, LTD., BRANTFORD, CANADA

Emulsifying water in oil with ARLACEL® C

Traditionally, one of the most difficult emulsion products to make is one in which a relatively small amount of water is dispersed in an oily base. This kind of emulsion is often characterized by a greasy "feel." At high temperatures, the oil and water phases tend to separate out.

In recent years, however, Arlacel C (sorbitan sesquioleate) has made water-in-oil emulsions comparatively easy to formulate. Notable among water-in-oil products made with Arlacel C are "cream" hair dressings, lotions, emollient creams and ointment bases. Some of these contain as much as 60 to 70 per cent oil or wax.

Emulsions properly formulated with Arlacel C are free from greasiness, and give a pleasantly smooth feeling when applied. They can withstand high temperatures without separation.

If your company manufactures emulsion products of any type, from paints to polishes, cosmetics to agricultural chemicals—Atlas' wide experience in emulsifiers is at your service.

New cosmetic idea—silicone protective creams

The water-repellency of silicones has aroused interest in the possibilities of using this property in protective creams.

The following is a typical soap-free silicone hand cream developed in our laboratory to illustrate usage of Atlas emulsifiers and sorbitol.

A	Triple-pressed stearic acid	20%
	ARLACEL® 60	1.5%
	TWEEN® 60	3.5%
	General Electric Silicone Fluid (Velvasil Fluid —1000)	10%
B	SORBO® sorbitol solution	20%
	Water	45%
	Preservative	q.s.
C	Perfume	q.s.

Heat (A) to 70° C. and (B) to 72° C. Add (B) to (A) with agitation, then cool while agitating to 45-50° C. Perfume and pack.

For added data on silicones in cosmetics, write to Atlas for a copy of the article, "Silicones, Properties and Possible Use in Cosmetics."

Wildroot Cream-Oil hair tonic, made by Wildroot Co., Inc., Buffalo, N.Y., is one of the many leading cosmetic preparations which use Atlas Products.

Soluble cutting oils formulated economically with ATPET® 100

Makers of soluble cutting oils can often simplify their formulation problems and reduce costs through the use of ATPET 100 as a combined emulsifier and corrosion inhibitor. Low in cost, ATPET 100 gives the finished oil a broad range of stability so that it can fit many different use conditions.

ATPET 100 is compatible with soaps or sulfonates. It often enables you to eliminate soaps and coupling agents, and thus reduce the number of additives you use from five or six to only two or three.

Samples, technical data and recommendations on use of ATPET 100 are yours for the asking.

MEET ATLAS AT THE "CHEM SHOW" FOR HELP IN IMPROVING YOUR PRODUCTS

See and hear demonstrations illustrating uses of sorbitol, surfactants, activated carbons

Be sure to visit the 25th Exposition of Chemical Industries—and plan on making the Atlas Booth—401—one of your major stopping points for new ideas.

The Atlas Booth is manned by technical and research representatives who speak your language. They are anxious to hear about your problems and to offer you their ideas for solving them. "Chem Show conversations" in the past have sparked many an Atlas research project into motion—resulting in new Atlas products, new and improved customer products.

This year in the Atlas Booth, you'll see interesting 5 to 10 minute demonstrations on the best-known Atlas products, Atlas sorbitol (polyol derived from sugar, used as a moisture-conditioning ingredient and for synthesis); Atlas surfactants (including emulsifiers, detergents, and anti-static agents); and Darco activated carbons, for removal of undesirable substances from chemical solutions.

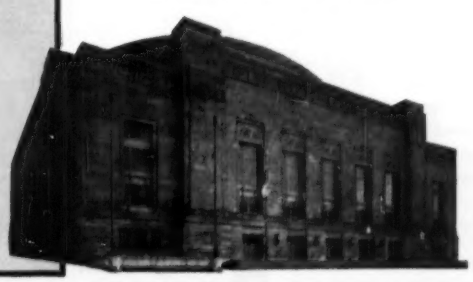
Other displays in the booth will feature new Atlas chemical developments that you'll want to evaluate in your own industry.

Can Atlas serve you? Chances are that we can if your interests lie with the products and industries noted in the table below. We'll be looking forward to seeing you!

"Shake hands with Atlas" in Booth 401, Convention Hall.

These products and industries use ATLAS sorbitol—mannitol—surfactants—plasticizers—polyester resins—DARCO activated carbons.

Adhesives	Edible Oils & Fats	Paper
Brewing	Electroplating	Perfumes
Chemicals	Explosives	Plastics
Cleaning Compounds	Foods	Pharmaceuticals
Confections	Glue Specialties	Polishes
Cosmetics	Herbicides	Resins
Cutting Oils	Inks	Sugar
Detergents	Insecticides	Textiles
Drugs	Lubricants	Tobacco
Dry Cleaning	Paints	Vitamin Products
		Water Purification



CONVENTION HALL, PHILADELPHIA, PA. · DECEMBER 5-9, 1955

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acetic acid	■		■		
acetic anhydride			■		dehydrating agent
acetone	■	■			
benzoquinone		■			
ethyl acetate	■				
hydroquinone dimethyl ether				■	ultraviolet inhibitor
isobutyl acetate	■				
isobutyl alcohol	■				
isobutyraldehyde		■			
isopropyl acetate	■				
oxidized cellulose					hemostatic agent and adsorbent
Tenox®				■	antioxidant series

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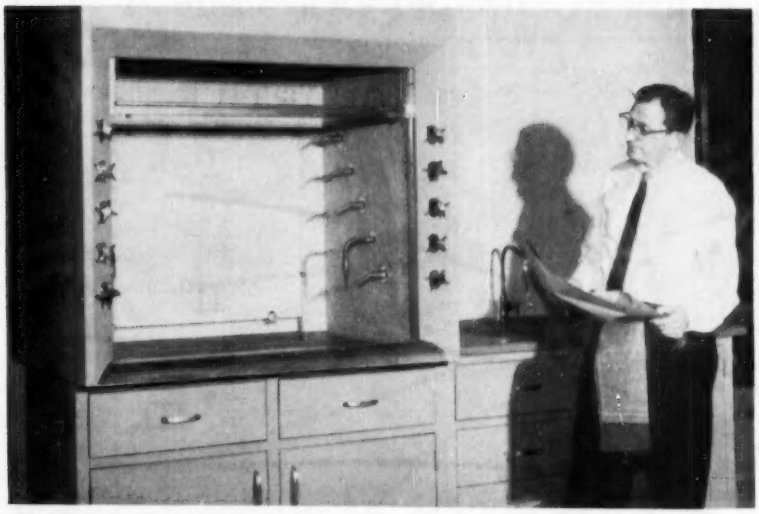


BOTH COUNT: Experienced consultants*, new equipment†. They're . . .

'Hot' Lab Helpmates

There's no gainsaying the powerful impact of radioisotope research on the laboratory furniture and equipment business. The recent boom in "hot" lab construction has been an important factor in pushing sales from a pre-World War II $3-4 million/year to an estimated $25 million this year—and the trend is still definitely up.

This period of accelerated growth has also been one of rapid education for apparatus makers. As a result, current and prospective builders of hot labs are heir to experience and services that were unavailable to their predecessors.

Five major firms in the field—Metalab Equipment Corp. (Hicksville, N.Y.), Kewaunee Mfg. Co. (Adrian, Mich.), Laboratory Furniture Co. (Mineola, N.Y.), Sheldon Co. (Muskegon, Mich.), and Hamilton Co. (Two Rivers, Wis.)—now provide technical assistance to companies interested in radiation work.

Field representatives work hand in hand with the customers' architects and engineers, gauge costs, advise on design, etc. Small firms, particularly, are taking advantage of this service.

But the intricacies of hot lab design are no longer the secret of a select few experts. Without minimizing the value of the expert, these experience-taught lessons might be profitably heeded by research directors facing up to their need for new radiation research facilities:

- Count on future expansion and be sure the structure can accommodate the additional shielding that will be required.
- Don't take permanent shielding where movable shielding will serve. Portable shielding (small lead containers, etc.) permits maximum flexibility of lab layout.
- For low-cost protection, utilize natural shielding wherever possible—i.e., use a basement lab if you can.
- Avoid plaster walls for the hot lab. They're hard to decontaminate, can raise dangerous dust if removal is necessary. Painted brick or concrete is best.
- Don't bank on disaster; with new apparatus, accidental large-scale contamination is a rarity. Strippable paint (for walls, furniture, etc.) and special flooring (e.g., solid sheet vinyls) should be reserved for labs where intense radiation is utilized. Walls painted with ordinary gloss or semi-gloss enamel and floors of conventional asphalt or vinyl tiles are acceptable for low-level radiation labs.
- Similarly, the level and type of radiation to be handled should determine the bench tops to be used. Stone surfaces, less expensive than stainless steel, may be entirely satisfactory.
- Avoid pressurized hoods—a possible source of contamination to the outside. Better: low-pressure hoods that keep turbulence to a minimum, conserve expensive conditioned air.
- And in ventilating, circulate air from "cool" to "hot" areas to minimize the possibility of contaminating the former.
- Locate waste containers in a part of the lab that's a judicious compromise between isolation and accessibility. Likewise, the hood or room designated for decontamination of glassware should be removed from the general working area.

Item: the decontamination area should have more rigid inspection than the rest of the laboratory because it will collect contaminated material of different radiation levels. It should be located as near to the storage waste disposal area as possible.

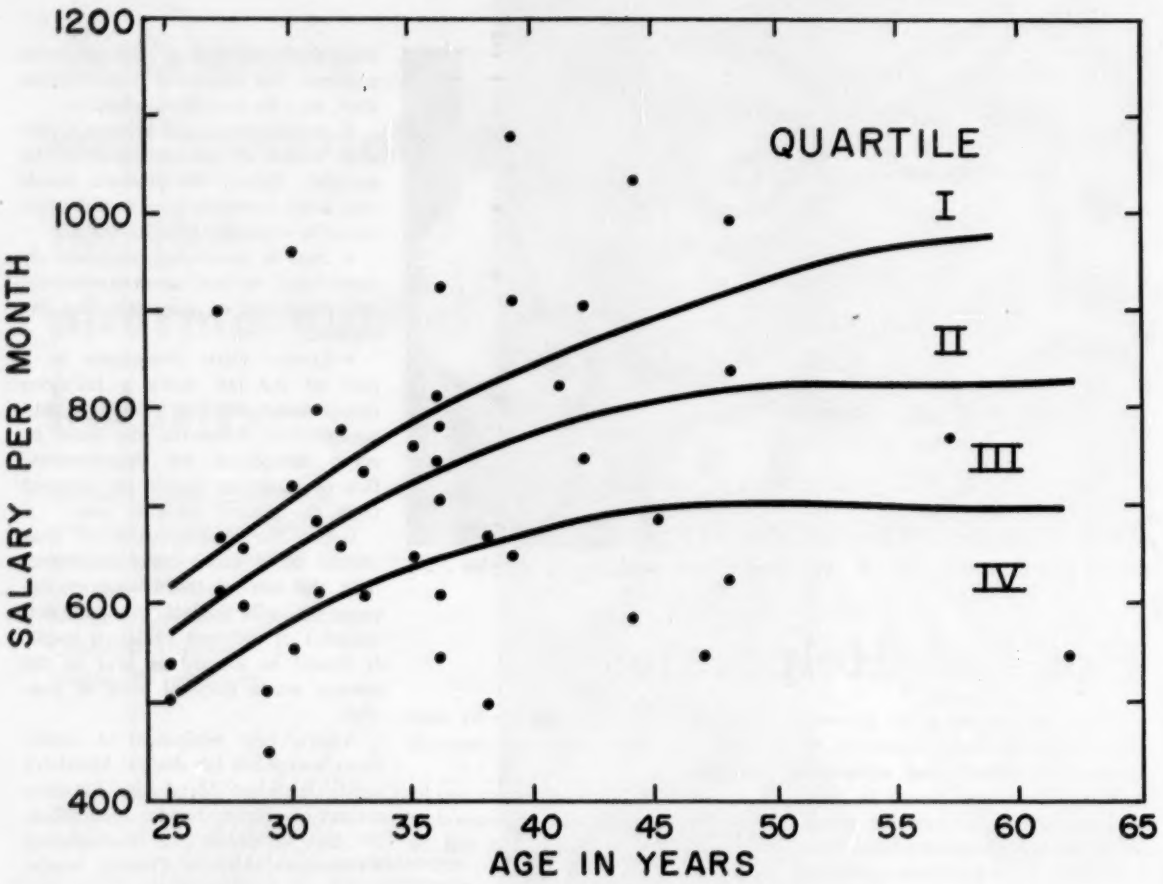
Among new equipment to implement sound hot lab design: Metalab's newly launched Metal-Aire Flowline series of fume hoods (controlled, 50 lin. ft./minute air throughput); Kewaunee's Airflow Control hoods; lead-lined cabinet drawers (to protect sensitive equipment); and shielding to protect the legs of seated isotope handlers.

Costs of furnishing hot labs vary widely, depend on such highly individual requirements as type of radiation to be handled, number of personnel employed, dimensions of the lab site, special engineering needs (for ducts, etc.), and plans for future expansion of facilities.

And hot labs aren't a low-cost investment; furnishings can be expected to cost a minimum of $1,000/lab worker. Fume hoods alone range as high as $3,000.

Progress in the still-young field of hot lab outfitting is bringing stiffer competition. Some equipment firms wryly report that free cost estimates, design consultations, etc., are being used by prospective customers as bargaining points in dealings with competitors. Hardly unanticipated, such discoveries are not slowing the development of new equipment and services for future hot lab builders.

* Metalab's Howard Plant.
† Low-pressure fume hood.



Charts' Tale: Pay More, Get More

A few highly productive people account for a disproportionately large share of research output, according to recently presented* statistics.

These outstanding performers are found to earn more than most researchers of their age group.

Implication for research recruiters: seek out the better-paid man; you'll get more for your dollar.

A West Coast research leader has gathered some data indicating that the most productive researchers make the most money. That doesn't astonish Beckman Instruments' William Shockley, the gatherer of the statistics, but his figures that tell "how much" and his ideas on how they could be used may be eye openers to many research management men.

Briefly, Shockley found:

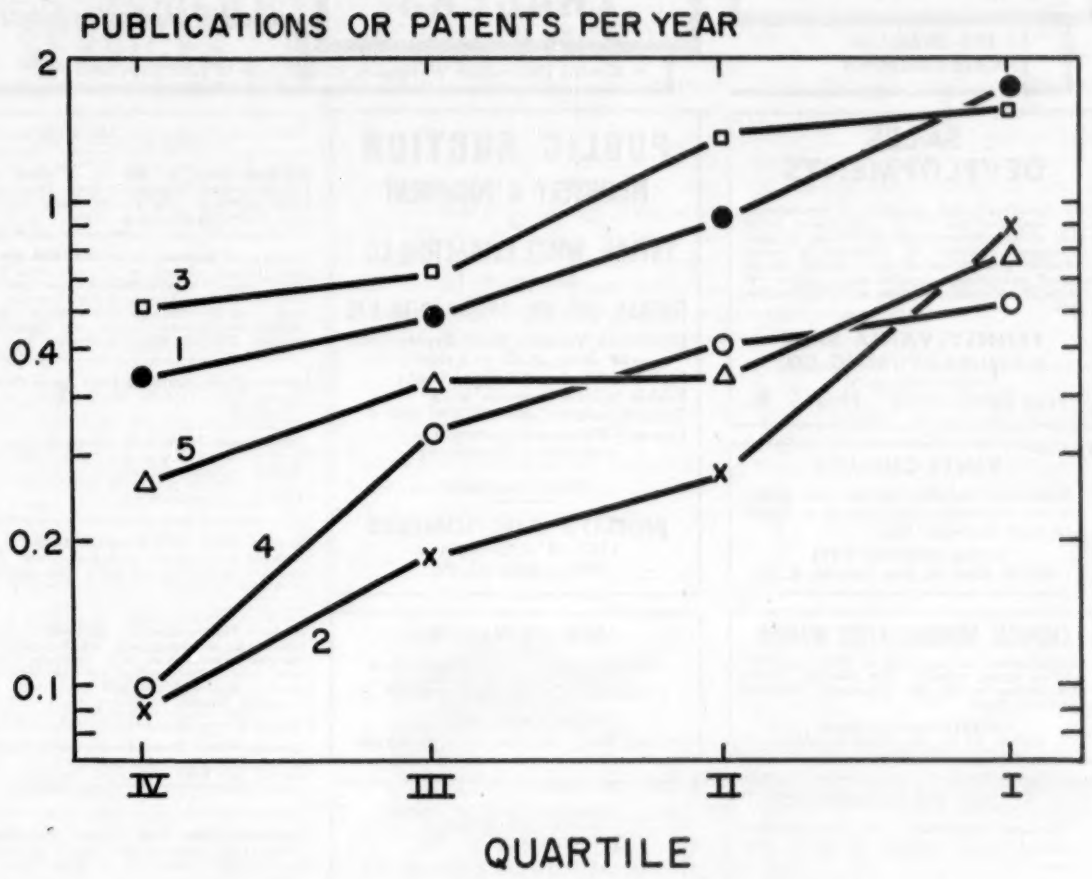
- There are a few outstanding performers in the organizations he studied—men who are at least 8-10 times more productive of publications and patents than the average. The exceptional men account for a large share of the output of these research groups.
- Salary reward lags increasing productivity by a proportionally large gap. A 10% boost in salary corresponds to 30-50% increase in output.
- Considerably more per dollar is obtained from higher-paid researchers than from their lower-salaried colleagues.

Purely a statistical exercise, Shockley's study will stand or fall on the validity of publications and patents as a measure of productivity. He offers no new evidence on this count, claims that other studies indicate that the heavy publishers turn out the most original work.

And he emphasizes that no cause-and-effect relationship should be read into his findings: giving a man a 10% raise will not necessarily make him 30-50% more productive.

What, then, is the work's value? Shockley hopes his findings will help to clarify the evaluation of a researcher's worth to his company, permit firms to procure and utilize their scientific talent more effectively. As a consequence of his study, he plans to concentrate on "outstanding per-

* Nov. 4, at the fall meeting of the National Academy of Sciences, California Institute of Technology, Pasadena.



formers" in staffing a new transistor research program he is organizing for Beckman.

"If a top research scientist can be persuaded to apply himself for even half his time, he will still be a profitable investment at a full-time top industrial salary, according to my findings," he claims. "We hope we may find a way of experimenting with this idea. . ."

Matter of Measure: The concept of worth figures prominently in Shockley's statistical investigations. Worth, in his context, should describe an individual's status with respect to his contemporaries from the standpoint of his employer.

He arrives at his worth factor by plotting researchers' ages against their salaries and dividing the research laboratory group into four categories based on results so obtained (*see chart, p. 148*). The first quartile is composed of individuals of all ages who are in the top 25% salary bracket for their age range. "These are evidently the ones to whom the company attaches the greatest worth," states Shockley.

Remaining individuals are separated into three lower quartiles, in order of decreasing salary.

When the publication records are studied separately for each worth quartile (*see chart, above*), the plot shows how the number of publications (and patents) increases from quartile to quartile. Quartile number one represents 3-10 times the number of publications of the lowest quartile. The difference varies from laboratory to laboratory; each curve on the chart stands for a different lab.

Among other things, the graph shows that a man in the top worth bracket may be making considerably less than twice the salary of the man in the lower group, while he's three to four times as productive.

It's also apparent that a number of individuals in the lower worth groups publish more than some of the top worth men—which goes to prove, Shockley agrees, that publication is only one (and by no means a perfect) factor in determining worth. He's fully aware that many other considerations enter into the value of a researcher to his company.

And he cautions against slipping into the easy pitfall of believing that statistics can replace judgment in assessing such an intangible as worth to the company.

It is nevertheless true that Shockley's studies* (encompassing data on researchers at Brookhaven National Laboratory, Los Alamos National Laboratory, University of California, Bureau of Standards and two large industrial laboratories) have considerable "worth" as an ambitious step in the direction of sounder research administration.

* Initiated several years ago while he was research director of the Defense Dept.'s weapons systems evaluation group.

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RESEARCH

Roundup: Office of Technical Services (Dept. of Commerce) recently released the complete collection of technical papers from the government synthetic (copolymer) rubber program. Comprising over 3,750 reports (prepared during Feb. 1, 1943—June 30, '54), the collection may be had only in microfilm or photocopy. Designated PB 118310, the papers are being distributed by Photoduplication Service, Library of Congress; prices quoted on request. A four-volume set of abstracts, labeled PB 111736, is available from OTS. Cost: $5/set.

•

Nuclear Probe: Stevens Institute of Technology (Hoboken, N. J.) is launching a study of the influence of radioactivity on chemical reactions. Financed by an Atomic Energy Commission grant, the project will concentrate on fundamental questions.

•

Pain Bane: Eli Lilly has a promising new analgesic agent in α-4-dimethylamino-1, 2-diphenyl-3-methyl-4-propionyloxybutane. This material showed (in animal tests) analgesic activity equal to that of codein, with a minimum of side effects. Attempts to induce toxic symptoms or drug tolerance (in two-week animal trials) reportedly were unsuccessful.

•

Sarkomycin: Bristol Laboratories staffers I. R. Hooper and L. C. Cheney report studies of cancer-inhibiting antibiotic Sarkomycin indicate it is a complex mixture, with 2-methylene-3-oxocyclopentanecarboxylic acid as the main active principle.

'Ouch-Meter' in Action

NEW ACCURACY in evaluating analgesics is claimed for this device developed by The Upjohn Co.'s William Bass and called, appropriately, an "ouch-meter." After receiving the pain-relieving drug, the test rat (*tail showing, right*) in the cage is stimulated by heat until his tail moves. The movement stops a timer via a photoelectric cell. Formerly, reaction time was observed visually, measured by a stop watch. Analgesic appraisal, conducted (*above*) by lab technician L. A. Schroeder, hinges on the distress reaction times of a large number of rats given varying drug dosages.

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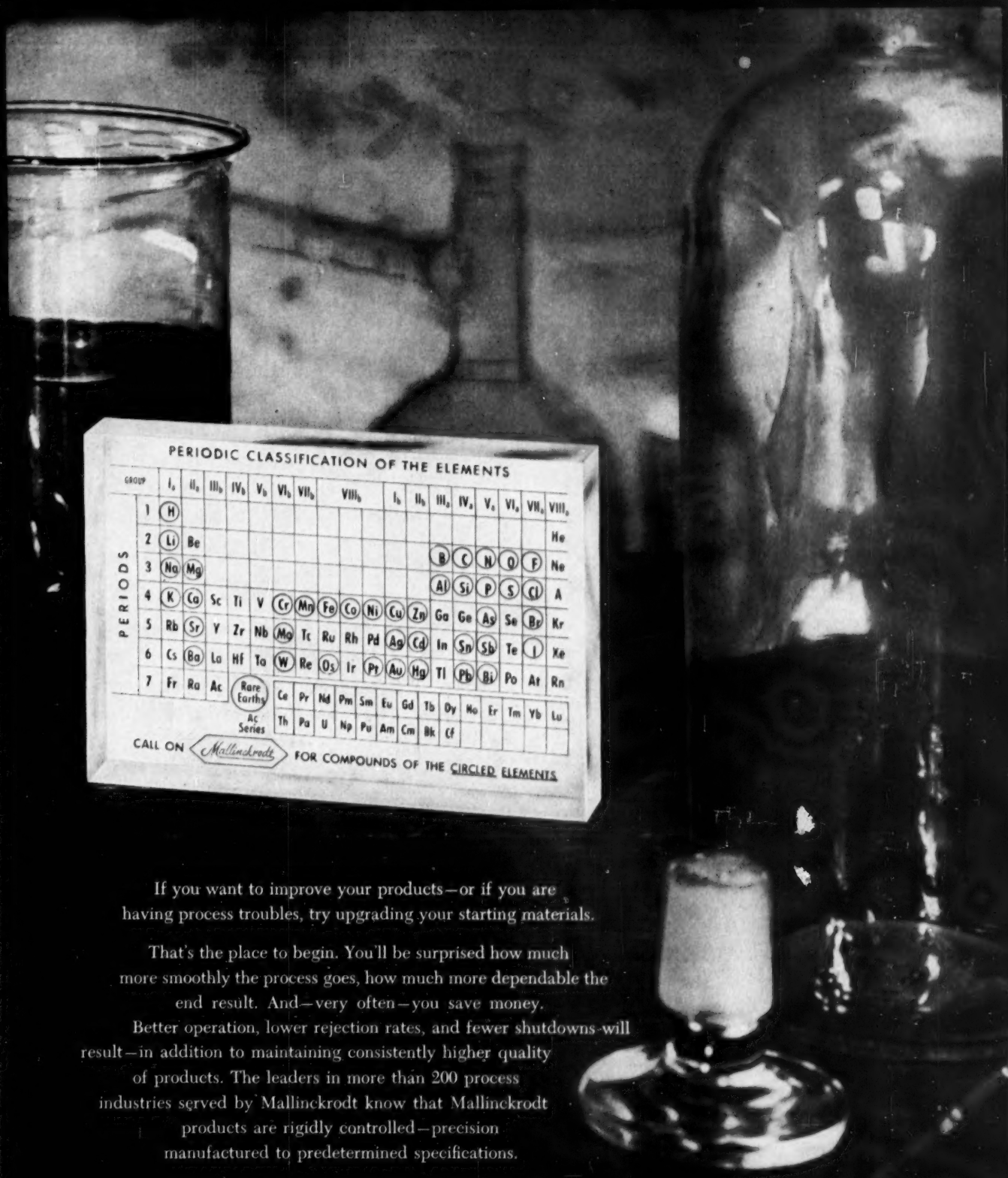

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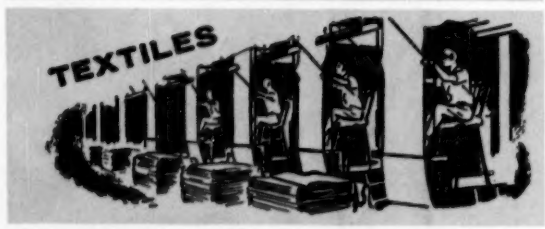

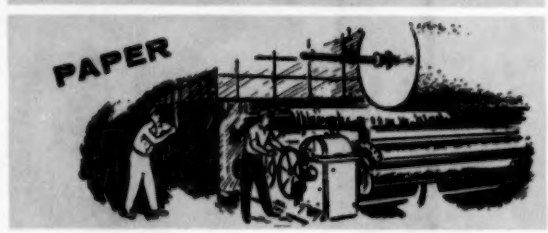

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